



Reservation for Economically Weaker Section

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Economically Weaker Section (EWS):

- People in the **Unreserved** category having **annual income < 8 LPA**
- **Owning property:** <5 acres (agricultural land); <200 m² (residential land)

EWS Quota:

- Based on the recommendations of **S.R. Sinho Commission (2010)**
- Introduced under the **103rd Constitutional Amendment (2019) inserting Articles 15 (6) and 16 (6)**
- Provides **reservation of 10% to EWS** in jobs and admissions in educational institutions
- Both **Centre and States** can provide reservation to the EWS

Supreme Court's Stand on EWS:

- SC **upheld the validity of 103rd Amendment**
- Majority view - EWS quota **doesn't violate Basic Structure** of the Constitution
- Minority view - **Excludes poorest of the poor** among SCs, STs and OBCs

Caste-based Reservation in India:

- **Constitutional Provisions:**
 - Govt. Ed. Institutions - Article 15 - (4), (5), and (6)
 - Govt. Jobs - Article 16 - (4) and (6)
 - Legislatures (State/Union) - Article 334
- **OBC Reservation** - introduced in **Mandal Commission Report (1991)**
- Concept of **Creamy layer** exists only in OBC reservation (and not in SC/ST)
- **Cap** on caste-based reservation - **50%** (in **Indra Sawhney case 1992**)
- First major SC verdict on Reservation - **Champakam Dorairajan case 1951**
 - It led to the **First Amendment in the Constitution** which added **Clause (4)** to Article 15

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Greenwashing

For Prelims: Greenwashing, Carbon Credit

For Mains: Greenwashing & Its Challenges, Effect of Greenwashing on Carbon Market

Why in News?

Recently, the **United Nations Secretary General** has warned private corporations to desist the practice

of **Greenwashing** and mend their ways within a year.

- The general has also directed to **set up an expert group solely to look into the practice.**

What is Greenwashing?

▪ About:

- The term greenwashing was first used in 1986 by Jay Westerveld, an American environmentalist and researcher.
- Greenwashing is the practice in which firms and governments **mark all kinds of activities as climate-friendly**, as something that would lead to emissions reduction, or avoidance of emissions.
 - Many of these claims are **unverifiable, misleading, or dubious.**
 - While it helps in boosting the image of the entity, **they do nothing in the fight against [climate change](#).**
 - Several multinational corporations, including oil giants like Shell and BP, and Coca Cola have faced accusations of greenwashing.
- Greenwashing is prevalent across a whole range of environmental activities.
 - Developed countries are often accused of **greenwashing their normal business investments in developing countries** by highlighting climate co-benefits of the financial flows, sometimes with very little justification.

▪ Impact of Greenwashing:

- Greenwashing presents a **false picture of the progress being made on the climate change front**, pushing the world towards disaster, while at the same time, rewarding entities for irresponsible behaviour.

▪ Challenges in Regulating:

- The processes and products that can potentially cut emissions are so many that it is **practically impossible to monitor and verify all.**
- The processes, methodologies and institutions to measure, report, create standards, verify claims and grant certifications are still being set up.
- Large number of organisations have sprung up claiming expertise in these areas and offering their services for a fee. Many of these organisations lack **integrity and robustness**, but their services are still availed by corporations because it makes them look good.

How does Greenwashing Affect Carbon Credits?

▪ About Carbon Credit:

- A [carbon credit](#) (also known as carbon offset) is a **credit for greenhouse emissions reduced or removed** from the atmosphere by an emission reduction project, which can be used by governments, industry, or private individuals to **compensate for the emissions** they generate elsewhere.
- Those that cannot easily reduce emissions can still operate, **at a higher financial cost.**
- Carbon credits are based on the "**cap-and-trade**" model that was used to reduce sulfur pollution in the 1990s.
- One carbon credit is equal to **one metric ton of carbon dioxide**, or in some markets, **carbon dioxide equivalent gases (CO₂-eq).**

▪ Effect of Greenwashing on Carbon Credit:

◦ Informal Markets:

- There are **now credits available** for all kinds of activities such as for growing trees, for planting a certain kind of crop, for installing energy-efficient equipment in office buildings.
 - The credits for such activities are often certified by unofficial third-party companies and sold to others.
 - Such transactions have been flagged for lack of integrity and double counting.

◦ Credibility:

- Countries like India or Brazil had accumulated huge carbon credits under the [Kyoto Protocol](#) and wanted these to be transitioned to the new market being set up under

the [Paris Agreement](#).

- But many developed countries resisted this, questioning the integrity of the credits and claiming they did not accurately represent reductions in emissions.
- Carbon offsets from forests are one of the most controversial.

Way Forward

- Corporations pursuing [net zero targets](#) **must not be allowed** to make fresh investments in fossil fuels.
 - They must also be asked to present short-term emission reduction goals on the path to achieving net zero.
- Corporations **should also use offset mechanisms at the start of their journey** to net-zero status.
- Priority should be focused towards the **creation of regulatory structures and standards** to monitor greenwashing.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Regarding “carbon credits”, which one of the following statements is not correct? **(2011)**

- (a)** The carbon credit system was ratified in conjunction with the Kyoto Protocol
- (b)** Carbon credits are awarded to countries or groups that have reduced greenhouse gases below their emission quota
- (c)** The goal of the carbon credit system is to limit the increase of carbon dioxide emission
- (d)** Carbon credits are traded at a price fixed from time to time by the United Nations Environment Programme.

Ans: (d)

Exp:

- Emissions trading, as set out in Article 17 of the Kyoto Protocol, allows countries that have carbon emission units to spare (i.e., the difference between total emission cap and emission done) – emissions permitted to them, but not “used” – to sell this excess capacity to countries that are over their targets.
- If a country emits less than its target amount of hydrocarbons, it can sell its surplus credits to countries that does not achieve their Kyoto level goals, through an Emission Reduction Purchase Agreement (ERPA).
- Certified Emission Reductions (CERs) are a type of emission units (or carbon credits) issued by the Executive Board of Clean Development Mechanism (CDM) for emission reductions achieved by CDM projects.
 - It is verified by a DOE (Designated Operational Entity) under the rules of the Kyoto Protocol.
- The Sustainable practices and application of eco friendly technologies produce carbon-credits that could be traded. Thus, it leads to reduction in GHGs emission as it creates a competitive and remunerative market. The United Nations’ Intergovernmental Panel on Climate Change (IPCC) developed the carbon credit regime as a “market-oriented mechanism”.
- **Therefore, option (d) is the correct answer.**

Mains

Q. Should the pursuit of carbon credits and clean development mechanisms set up under UNFCCC be maintained even though there has been a massive slide in the value of a carbon credit? Discuss with

respect to India's energy needs for economic growth. (2014)

[Source: IE](#)

Dynamic Ground Water Resource Assessment, 2022

For Prelims: Central Ground Water Board, heavy metal, Atal Bhujal Yojana, Jal Shakti Abhiyan

For Mains: Groundwater and challenges with its management

Why in News?

Recently, the Union Minister of Jal Shakti released the Dynamic Ground Water Resource Assessment Report for the entire country for the year 2022.

What are the Highlights of the Assessment?

▪ Findings:

- The total annual ground water recharge is 437.60 Billion Cubic Meters (BCM) and the annual ground water extraction is 239.16 BCM.
 - Assessment indicates an increase in ground water recharge.
 - **By comparison, an assessment in 2020 found that the annual groundwater recharge was 436 bcm** and extraction 245 bcm.
 - Groundwater Recharge is a **(hydrologic) process where the water from the surface of the earth seeps downwards** and gets collected in aquifers. So, the process is also known as deep drainage or deep percolation.
- The 2022 assessment suggests that groundwater extraction is the lowest since 2004, when it was 231 bcm.
- Further, out of the total 7089 assessment units in the country, **1006 units have been categorized as 'Over-exploited'**.
- About **87% of total annual groundwater extraction** i.e., 208.49 bcm **is for irrigation use**. Only 30.69 bcm is for Domestic & Industrial use, which is about 13 % of the total extraction.

▪ State wise Groundwater Extraction:

- The overall stage of **groundwater extraction in the country is 60.08%**.
- The stage of ground water extraction is **very high in the states of Haryana, Punjab, Rajasthan, Dadra & Nagar Haveli and Daman & Diu** where it is **more than 100%**.
- In the states of Delhi, Tamil Nadu, Uttar Pradesh, Karnataka and UTs of Chandigarh, Lakshadweep and Puducherry, the stage of **ground water extraction is between 60-100%**.
- In the rest of the states, the stage of ground water extraction is below 60 %.

What is the Status of Groundwater in India?

▪ About:

- **India is the largest user of groundwater** with a fourth of the total global withdrawal.

Indian cities cater to about 48% of its water supply from groundwater.

- There are over 4,400 statutory towns and cities in India, with around 400 million residents, which will increase by up to 300 million by 2050.

▪ **Issues with Groundwater Depletion:**

- The **unmanaged groundwater and increasing population may result in seasonal water shortages by 2050** for an estimated 3.1 billion people and perpetual water shortage for almost a billion.
- Further, water and food security will also be compromised and lead to [poverty](#) in the cities despite having good infrastructure development.

What are the Challenges with Management of Groundwater in India?

▪ **Unregulated extraction**

- **Groundwater, regarded as a “common pool resource”**, has historically witnessed little control over its extraction.
- Driven by a rising population, [urbanisation](#) and expansion of irrigation activities, groundwater extraction has been on the rise for several decades.

▪ **Excessive Irrigation:**

- Groundwater irrigation popularised in the 1970s has led to socio-economic well-being, increased productivity and better livelihoods.

▪ **Poor Knowledge of Groundwater Management Systems:**

- **The mismatch in demand and supply at the local level** represents a large part of the problem in India.
- A growing population or rampant urban development are two examples of the reasons behind this phenomenon, but they may be less direct.
- For example, better economic status of a population may assert more demand for water supply and distribution.

▪ **Groundwater Pollution:**

- Water quality data obtained by the [Central Ground Water Board \(CGWB\)](#) shows that **groundwater in as many as 154 districts across 21 states has arsenic contamination.**
- The quality is largely compromised on **accounts of anthropogenic activities and geogenic sources.**
- This further **raises the level of contamination as heavy metal concentration** in the earth's crust is higher than on the surface.
- Additionally, **surface water pollution also affects groundwater quality as pollutants at the water surface percolate through the layers of the land**, contaminating groundwater, and may even alter the soil structure in case of oil leakages or spillage.

▪ **Climate Change:**

- The **cumulative effect of all the challenges mentioned above is intensified by the climate shocks** experienced by the country.
- The **problems groundwater faces in India feeds into worsening the climate** crisis, which further deepens the distress associated with groundwater availability.
- Disturbances in the hydrological cycle causing long spells of [floods](#) and [droughts](#) adversely affect the quality and quantity of groundwater.
 - For example, flood events risk increased runoff of chemicals and biotic contaminants into groundwater.

What are the Initiatives Taken by the Government?

- [Atal Bhujal Yojana \(Atal Jal\)](#): It is a Rs. 6000 crore **Central Sector Scheme** with **World Bank** assistance, for sustainable management of ground water resources with community participation.
- [Jal Shakti Abhiyan \(JSA\)](#): It was launched in 2019 in 256 water stressed districts in the country to improve water availability including ground water conditions in these areas.
 - It has special emphasis on creation of recharge structures, rejuvenation of traditional water bodies, intensive afforestation etc.
- **Aquifer Mapping and Management Programme**: The CGWB has taken up [Aquifer Mapping and Management Programme](#).
 - The program is aimed to delineate aquifer disposition and their characterization for

preparation of aquifer/ area specific groundwater management plans with community participation.

- [Atal Mission for Rejuvenation and Urban Transformation \(AMRUT\)](#): The Mission focuses on development of basic urban infrastructure in the AMRUT cities, such as water supply, sewerage & septage management, storm water drainage, green spaces & parks, and non-motorized urban transport.

Way Forward

- **Integrated Water Resource Management framework:**
 - There is a need to focus on the Integrated Water Resource Management framework. It promotes the coordinated development and management of water, land and related resources.
- **Adopting Water Sensitive Urban Design:**
 - To begin with, adopting water-sensitive urban design and planning can help maintain the water cycle by managing groundwater, surface water and rainwater for water demand and supply.
- **Provision for Water Recycle and Reuse:**
 - Provision for wastewater recycle and its reuse to promote the circular economy of one water cycle will also help in source sustainability and groundwater pollution mitigation.
- **Other Interventions:**
 - Interventions like rainwater harvesting, stormwater harvesting, rain-garden and bio-retention ponds that intercept rainfall with vegetated land are low-maintenance alternatives to conventional systems. These help in groundwater recharge and urban flood mitigation.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Consider the following statements: (2020)

1. 36% of India's districts are classified as "overexploited" or "critical" by the Central Ground Water Authority (CGWA).
2. CGWA was formed under the Environment (Protection) Act.
3. India has the largest area under groundwater irrigation in the world.

Which of the statements given above is/are correct.

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

Ans: (b)

- Based on groundwater levels, areas across the country are split into three categories: Over-exploited, Critical and Semi critical. The first refers to groundwater being extracted more than what's recharged i.e. extraction is more than 100%. Critical where the groundwater taken out is 90-100% of what's recharged and semi-critical where extraction rate is 70%-90%.
- As per the report 'National Compilation on Dynamic Groundwater Resources of India, 2017' of CGWA, out of the total 6881 assessment units (Blocks/ Mandals/Talukas) in the country, 1186 units in various States (17%) have been categorized as 'OverExploited', 313 units (5%) are 'Critical', and 972 are semi-critical units (14%). **Hence, statement 1 is not correct.**
- Note: As per National Compilation on Dynamic Groundwater Resources of India 2020; Out of the total 6965 assessment units (Blocks/ Mandals/ Talukas/ Firkas) in the country, 16 % have been categorized as 'Over-exploited, 4 % as Critical, 15 % as Semi-critical and 64 %) as 'Safe' units. Apart from these, there are 97 (1%) assessment units, which have been categorised as 'Saline'.
- The Central Ground Water Authority (CGWA) was constituted under Section 3(3) of the

Environment (Protection) Act, 1986 to regulate, control development and management of ground water resources. **Hence, statement 2 is correct.**

- As per report of Food and Agriculture Organization (FAO) of UN, the countries with the largest extent of areas equipped for irrigation with groundwater, in absolute terms, are India (39 million ha), China (19 million ha) and the USA (17 million ha). **Hence, statement 3 is correct. Therefore, option (b) is the correct answer.**

Mains

Q. India is well endowed with fresh water resources. Critically examine why it still suffers from water scarcity. **(2015)**

Q. The ideal solution of depleting ground water resources in India is water harvesting system". How can it be made effective in urban areas? **(2018)**

[Source: PIB](#)

India's First Sovereign Green Bonds Framework

For Prelims: Features of Sovereign green bonds, Sovereign Green Bonds Framework

For Mains: Sovereign Green Bonds, Announcement under Budget, Status of Green Bonds

Why in News?

Recently, the **Union Minister for Finance & Corporate Affairs** has approved the final [Sovereign Green Bonds Framework of India](#).

- **Sovereign Green Bonds will be issued** for mobilising resources for **green projects**.

What is Sovereign Green Bonds Framework?

- The Framework comes close on the footsteps of India's commitments under "**Panchamrit**" as elucidated by the Prime Minister at [Conference of Parties \(COP\) 26](#) at Glasgow in November 2021.
- It will further strengthen India's commitment towards its [Nationally Determined Contribution \(NDCs\)](#) targets, adopted under the [Paris Agreement](#).
- **Green Finance Working Committee (GFWC)** was constituted to validate key decisions on issuance of Sovereign Green Bonds.
- The framework has been rated '**Medium Green**', with a "**Good**" governance score by a Norway-based independent second opinion provider **CICERO**.
 - The '**Medium Green**' rating is assigned 'to projects and solutions that represent **significant steps towards the long-term vision**, but are not quite there yet.
- All **fossil fuel-related projects** have been kept **out of the framework**, along with **biomass-based renewable energy projects** that rely on feedstock from '**protected areas**'.

What are Sovereign Green Bonds?

▪ **About:**

- **Green bonds** are issued by companies, countries and multilateral organisations to exclusively **fund projects that have positive environmental or climate benefits** and provide investors with fixed income payments.
- The projects can include [renewable energy](#), **clean transportation** and **green buildings**, among others.
- Proceeds from these bonds are **earmarked for green projects**. This is unlike standard bonds, the proceeds of which can be utilized for various purposes at the discretion of the issuer.
- By the end of 2020, **24 national governments had issued Sovereign Green, Social and Sustainability bonds** totalling a cumulative USD 111 billion dollars, according to the London-based Climate Bonds Initiative.

▪ **Benefits of Sovereign Green Bonds:**

- **Sovereign green issuance** sends a powerful signal of **intent around climate action** and [sustainable development](#) to governments and regulators.
- With the [International Energy Agency's \(IEA\)](#) World Energy Outlook 2021, estimating that **70% of the additional USD 4 trillion spending** to reach [net-zero](#) is required in emerging/developing economies, sovereign issuance can help kickstart these large inflows of capital.
- Development of a sovereign green benchmark could eventually **lead to the creation of a vibrant ecosystem** of raising green bonds from **international investors**.

▪ **Status:**

◦ **Global Status:**

- [The Environmental, Social and Governance \(ESG\)](#) funds are estimated at USD 40 trillion with Europe accounting for about half this.
- It is estimated that by 2025, ESG assets will account for about one-third of the total global assets under management.
- The ESG debt funds pie is around USD 2 trillion, of which over 80% is “environmental” or green bonds, and the rest social and sustainability bonds.

◦ **National Status:**

- According to the Climate Bonds Initiative, an international organization working to mobilize global capital for climate action, **Indian entities have issued green bonds for over USD 18 billion**.

What are Other Measures on Climate Action announced in the Budget?

- The budget included several measures on climate action such as:
 - [Battery swapping policy](#).
 - Additional allocation under the [Performance Linked Incentive \(PLI\)](#) scheme for manufacturing high efficiency solar modules.
 - The government is introducing a new bill that aims to provide a regulatory framework for [Carbon Trading](#) in India to encourage penetration of renewables in the energy mix.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Indian Government Bond Yields are influenced by which of the following? (2021)

1. Actions of the United States Federal Reserve
2. Actions of the Reserve Bank of India
3. Inflation and short-term interest rates

Select the correct answer using the code given below.

- (a) 1 and 2 only
(b) 2 only

- (c) 3 only
(d) 1, 2 and 3

Ans: (d)

Exp:

- Bond is an instrument to borrow money. A bond could be issued by a country's government or by a company to raise funds.
- Bond yield is the return an investor realizes on a bond.
- The mathematical formula for calculating yield is the annual coupon rate divided by the current market price of the bond.
- Movements in yields depend on trends in interest rates, it can result in capital gains or losses for investors.
 - A rise in bond yields in the market will bring the price of the bond down.
 - A drop in bond yield would benefit the investor as the price of the bond will rise, generating capital gains.
- Fed tapering is the gradual reduction in the bond buying program of the US Federal Reserve. So, any actions of the United States Federal Reserve impact the bond yield in India. Hence, 1 is correct.
- The actions of the RBI plays a crucial role in determining the yield of government bonds. The sovereign yield curve has a special significance for monetary policy in influencing a wide array of interest rates in the economy. Hence, 2 is correct.
- Inflation and short-term interest rates also influence the yield of government bonds. Hence, 3 is correct.
- Therefore, option (d) is the correct answer.

Q2. With reference to 'IFC Masala Bonds', sometimes seen in the news, which of the statements given below is/ are correct? (2016)

1. The International Finance Corporation, which offers these bonds, is an arm of the World Bank.
2. They are the rupee-denominated bonds and are a source of debt financing for the public and private sector.

Select the correct answer using the code given below:

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

Ans: (c)

Exp:

- The World Bank Group, which is a vital source of financial and technical assistance to developing countries, consists of five distinct yet complementary organizations, viz.,
 - International Bank for Reconstruction and Development (IBRD);
 - International Development Association (IDA);
 - International Finance Corporation (IFC); hence, statement 1 is correct.
 - Multilateral Investment Guarantee Agency (MIGA);
 - International Centre for Settlement of Investment Disputes (ICSID).
- Membership in IFC is open only to member countries of the World Bank. Its board was established in 1956. IFC is owned by 184 member countries, a group that collectively determines the policies. Through a Board of Governors and a Board of Directors, the member countries guide IFC's programs and activities.
- Masala Bonds are rupee-denominated borrowings issued by Indian entities in overseas markets. Masala means 'spices' and the term was used by International Finance Corporation (IFC) to popularise the culture and cuisine of India on foreign platforms. The objective of Masala Bonds is to

fund infrastructure projects in India, fuel internal growth via borrowings and internationalize the Indian currency. Hence, statement 2 is correct.

- Therefore, option (c) is the correct answer.

[Source: PIB](#)

Earthquake

For Prelims: India and Eurasia Plates, Types of Earthquakes.

For Mains: Earthquake, its Distribution and Types.

Why in News?

Recently, Powerful tremors were felt in India after an [earthquake](#) of magnitude 6.6 struck Nepal, which killed a few people and destroyed multiple houses.

What Caused these Tremors?

- According to the **United States Geological Survey (USGS)** the tremors are attributed to the continental collisions of [India and Eurasia Plates](#), which is the dominating force for the Seismicity in the Himalayas.
- These plates are converging at a relative rate of 40-50 millimeters per year.
- Northward under thrusting of India beneath Eurasia generates numerous earthquakes and consequently **makes this area one of the most seismically hazardous regions on Earth.**
 - The Himalayas and their vicinity have witnessed some of the most lethal earthquakes such as one of magnitude 8.1 Bihar in 1934, the 1905 magnitude 7.5 quake in Kangra and the 2005 magnitude 7.6 quake in Kashmir.

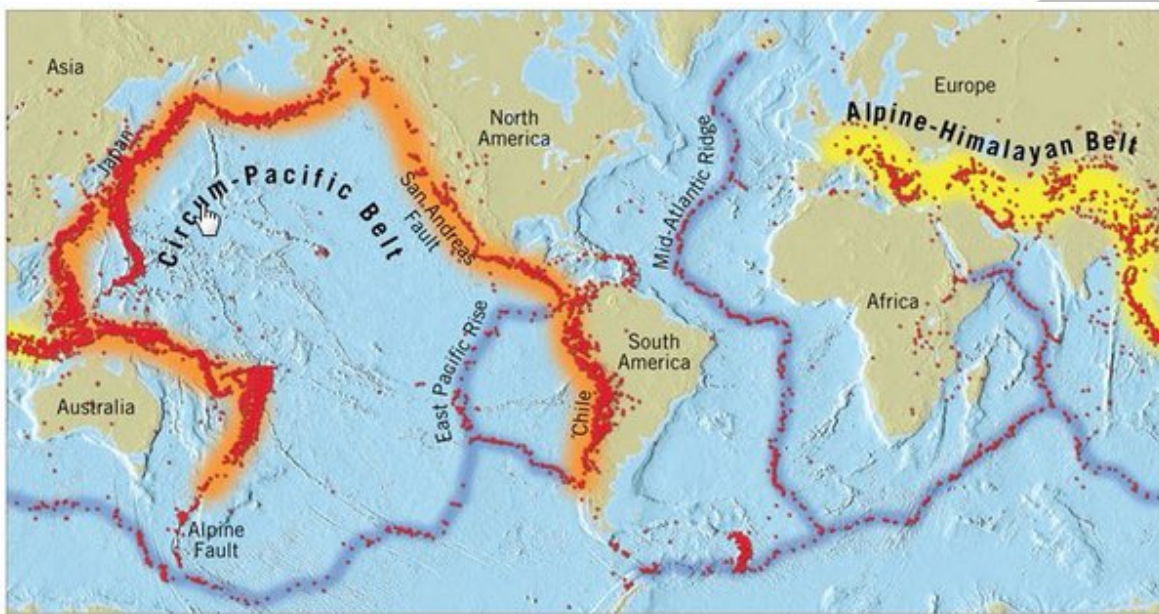
What is an Earthquake?

- **About:**
 - An earthquake in simple words is the shaking of the earth. It is a natural event. It is caused due to release of energy, which generates waves that travel in all directions.
 - The vibrations called **seismic waves** are generated from earthquakes that travel through the Earth and are recorded on instruments called seismographs.
 - The location below the earth's surface where the earthquake starts is called the **hypocenter**, and the location directly above it on the surface of the earth is called the **epicenter**.
 - [Types of Earthquake:](#) Fault Zones, Tectonic Earthquakes, Volcanic Earthquake, Human Induced Earthquakes.
 - The earthquake events are scaled either according to the magnitude or intensity of the shock. The magnitude scale is known as the **Richter scale**. The magnitude relates to the energy released during the quake. The **magnitude is expressed in absolute numbers, 0-10.**
 - The **intensity scale is named after Mercalli**, an Italian seismologist. The intensity scale takes into account the visible damage caused by the event. The **range of intensity scale**

is from 1-12.

▪ **Distribution of Earthquake:**

- **Circum-Pacific Seismic Belt:** The world's greatest earthquake belt, the circum-Pacific seismic belt, is found along the rim of the Pacific Ocean, where about **81% of our planet's largest earthquakes occur**. It has earned the nickname "Ring of Fire".
 - The belt exists along boundaries of tectonic plates, where plates of mostly oceanic crust are sinking (or subducting) beneath another plate. Earthquakes in these subduction zones are caused by slip between plates and rupture within plates.
- **Mid Continental Belt:** The Alpine-Himalayan belt (mid-Continental belt) extends from Europe to Sumatra through the Himalayas, the Mediterranean, and out into the Atlantic.
 - This belt accounts for about 17% of the world's largest earthquakes, including some of the most destructive.
- **Mid-Atlantic Ridge:** The third prominent belt follows the submerged mid-Atlantic Ridge. The ridge marks where two tectonic plates are spreading apart (a divergent plate boundary).
 - Most of the mid-Atlantic Ridge is deep underwater and far from human development.



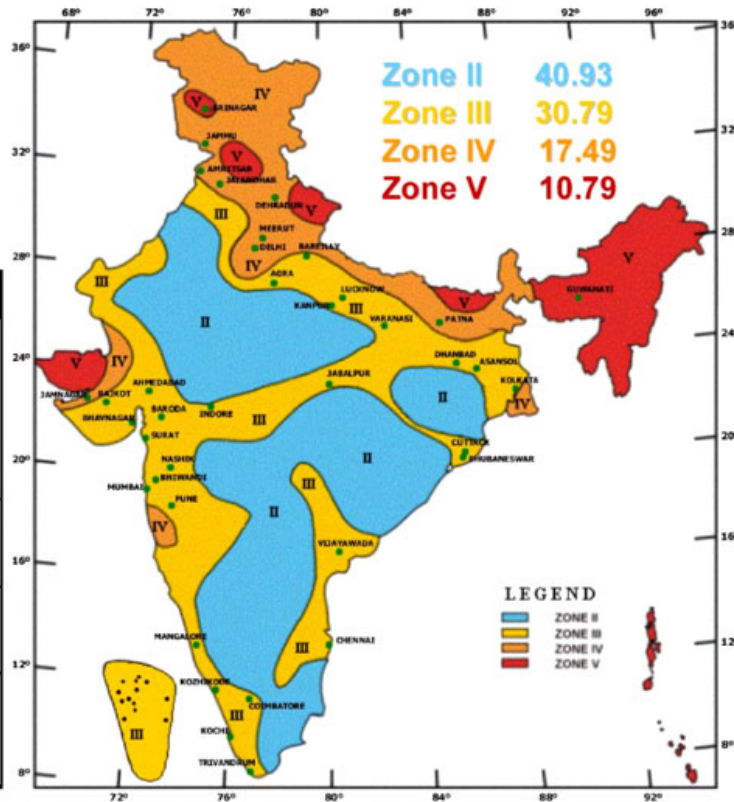
What is the Seismic Hazard Map of India?

- India is one of the highly earthquake affected countries because of the presence of technically active young fold mountains - Himalaya.
- India has been divided into **four seismic zones (II, III, IV, and V)** based on scientific inputs relating to seismicity, earthquakes that occurred in the past and tectonic setup of the region.
- Previously, earthquake zones were divided into five zones with respect to the severity of the earthquakes but the [Bureau of Indian Standards \(BIS\)](#) grouped the country into four seismic zones by unifying the first two zones.
 - BIS is the official agency for publishing the seismic hazard maps and codes.

Seismic Zone Map of India: -2002

About 59 percent of the land area of India is liable to seismic hazard damage

Zone	Intensity
Zone V	Very High Risk Zone Area liable to shaking Intensity IX (and above)
Zone IV	High Risk Zone Intensity VIII
Zone III	Moderate Risk Zone Intensity VII
Zone II	Low Risk Zone VI (and lower)



- **Seismic Zone II:**
 - Area with minor damage earthquakes corresponding to intensities V to VI of MM scale (MM-Modified Mercalli Intensity scale).
- **Seismic Zone III:**
 - Moderate damage corresponding to intensity VII of MM scale.
- **Seismic Zone IV:**
 - Major damage corresponding to intensity VII and higher of MM scale.
- **Seismic Zone V:**
 - Area determined by the seismics of certain major fault systems and is seismically the most active region.
 - Earthquake zone V is the most vulnerable to earthquakes, where historically some of the country's most powerful shocks have occurred.
 - Earthquakes with magnitudes in excess of 7.0 have occurred in these areas, and have had intensities higher than IX.

UPSC Civil Services Examination Previous Year Question (PYQ)

Q. The frequency of earthquakes appears to have increased in the Indian subcontinent. However, India's preparedness for mitigating their impact has significant gaps. Discuss various aspects. **(2015)**

Q. Discuss about the vulnerability of India to earthquake related hazards. Give examples including the salient features of major disasters caused by earthquakes in different parts of India during the last three decades. **(2021)**

Carbon Sequestration

For Prelims: Carbon Sequestration

For Mains: Carbon Sequestration, Environmental Pollution & Degradation

Why in News?

According to a recent study conducted in Maharashtra and Odisha, soil carbon sequestration may help fight [climate change](#).

- Studying is aligned with [Sustainable Development Goal 13](#) (SDG 13: Climate Action) which is on taking urgent action to combat climate change and its impacts.
- The study revealed how the right combination of fertiliser, biochar, and irrigation could potentially increase soil carbon by as much as 300% and help mitigate climate change.

What is Carbon Sequestration?

- **About:**
 - Carbon sequestration is the **long-term storage of carbon in plants, soils, geologic formations, and the ocean**.
 - Carbon sequestration occurs both naturally and as a result of anthropogenic activities and typically refers to the storage of carbon.
- **Types:**
 - **Terrestrial Carbon Sequestration:**
 - Terrestrial carbon sequestration is the **process through which CO₂ from the atmosphere is absorbed by trees and plants** through photosynthesis and stored as carbon in soils and biomass (tree trunks, branches, foliage, and roots)
 - **Geologic Carbon Sequestration:**
 - **CO₂ can be stored, including oil reservoirs, gas reservoirs, unmineable coal seams**, saline formations and shale formations with high organic content.
 - **Ocean Carbon Sequestration:**
 - **Oceans absorb, release and store large amounts of CO₂** from the atmosphere. This can be done in two ways- enhancing productivity of ocean biological systems through Iron fertilization, and injecting CO₂ into the deep ocean.
 - The dumping of iron stimulates phytoplankton production, which in turn leads to enhanced photosynthesis from these microorganisms, helping in CO₂ absorption.

What are the Different Methods of Carbon Sequestration?

- **Natural Carbon Sequestration:**
 - It is the **process by which nature has achieved a balance of carbon dioxide in our atmosphere** suitable for sustaining life. Animals expel carbon dioxide, as do plants during the night.
 - Nature provided trees, the oceans, earth and the animals themselves as carbon sinks, or sponges. All organic life on this planet is carbon based and when plants and animals die, much of the carbon goes back into the ground where it has little impact on contributing to global warming.
- **Artificial Carbon Sequestration:**
 - Artificial carbon sequestration refers to a **number of processes whereby carbon**

emissions are captured at the point of production (e.g., Factory Chimneys) and then buried.

- One proposed method is ocean sequestration whereby carbon dioxide is injected deep into the ocean, forming lakes of CO₂. In theory, the CO₂ will stay down deep due to the pressure and temperature of the surrounding water, gradually dissolving into that water over time.
 - Another example is geological sequestration where **the carbon dioxide is pumped into underground chambers** such as old oil reservoirs, aquifers and coal seams that are unable to be mined.

Why is Carbon Sequestration a viable Option for Agriculture?

- **Climate Friendly:** Carbon Farming (Carbon Sequestration) involves practices that are known to improve the rate at which CO₂ is removed from the atmosphere and **converted to plant material and soil organic matter**.
 - It **promises a bold new agricultural business model** — one that fights climate change, creates jobs, and saves farms that might otherwise be unprofitable.
 - In essence, a climate solution, and increased income generation opportunity and ensuring a food security net for the population.
- **Optimising Carbon Capture:** It is a **whole farm approach to optimising carbon capture on working landscapes** by implementing practices that are known to improve the rate at which CO₂ is removed from the atmosphere and stored in plant material and/or soil organic matter.
 - It can incentivise our farmers to introduce regenerative practices in their agricultural processes, helping them shift their focus from improving yields to functioning ecosystems and sequestering carbon that can be sold or traded in carbon markets.
- **Farmer Friendly:** It not only improves the health of soil but can also result in improved quality, organic and chemical-free food (farm-to-fork models) along with boosted/secondary income from **carbon credits** for the marginalised farmers.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q1. Consider the following agricultural practices: (2012)

1. Contour bunding
2. Relay cropping
3. Zero tillage

In the context of global climate change, which of the above helps/help in carbon sequestration/storage in the soil?

- (a) 1 and 2 only
- (b) 3 only
- (c) 1, 2 and 3
- (d) None of them

Ans: (b)

Q2. In the context of mitigating the impending global warming due to anthropogenic emissions of carbon dioxide, which of the following can be the potential sites for carbon sequestration? (2017)

1. Abandoned and uneconomic coal seams
2. Depleted oil and gas reservoirs
3. Subterranean deep saline formations

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

Ans: (d)

Q3. What is/are the advantage/advantages of zero tillage in agriculture? (2020)

1. Sowing of wheat is possible without burning the residue of previous crop.
2. Without the need for nursery of rice saplings, direct planting of paddy seeds in the wet soil is possible.
3. Carbon sequestration in the soil is possible.

Select the correct answer using the code given below:

- (a) 1 and 2 only
(b) 2 and 3 only
(c) 3 only
(d) 1, 2 and 3

Ans: (d)

[Source: DTE](#)

Age of Consent for Adolescents

For Prelims: Protection of Children from Sexual Offences Act, 2012, Indian Penal Code.

For mains: Age of Consent for Adolescents under POCSO Act and related concerns.

Why in News?

The [Chief Justice of India's](#) message to Parliament to address concerns about the age of consent under the [POCSO Act \(Protection of Children from Sexual Offences Act\)](#) is the culmination of a series of events. The Madras, Delhi and Meghalaya High Courts have flagged matters concerning criminalisation of romantic relationships between or with an adolescent under POCSO.

- In November 2022, the Delhi [High Court](#) in **AK v. State Govt of NCT of Delhi** (order by Justice Jasmeet Singh) stated that the intention of POCSO was to protect children below the age of 18 years from sexual exploitation and not to criminalise romantic relationships between consenting young adults.
- However, in December 2022, the government told Parliament that it does not have any plan to revise the age of consent.

What is the POCSO Act, 2012?

- **About:**
 - It defines a child as any person **below eighteen years of age and regards the best interests** and welfare of the child as a matter of paramount importance at every stage, to ensure the **healthy physical, emotional, intellectual and social development** of the

child.

- It defines different forms of sexual abuse, **including penetrative and non-penetrative assault**, as well as sexual harassment and pornography.
 - It deems a sexual assault to be **“aggravated”** under certain circumstances, such as when the abused child is mentally ill or when the abuse is committed by a person in a position of trust or authority like a family member, police officer, teacher, or doctor.
 - It also casts the police in the role of child protectors during the investigative process.
 - The Act stipulates that a case of child sexual abuse **must be disposed of within one year** from the date the offence is reported.
 - It was [amended in August 2019](#) to provide more stringent punishment, including the death penalty, for sexual crimes against children.
- **Age of Consent:**
- The POCSO Act criminalizes all sexual acts among those under 18 regardless of **whether consent is present factually among the minors** because the presumption of the law is that there is no consent in the legal sense among those below 18.

What are the Issues with Age of Consent under the Act?

- **Instrument to Silence or Regulate a Consensual Sexual Relationship:** The root cause of the problem at hand is that POCSO conflates exploitative sexual practice and general sexual expression by an adolescent and criminalises both.
 - As a result, criminal law has become an instrument to silence or regulate a non-exploitative consensual sexual relationship involving a minor girl, which is voluntary.
- **Desexualises Minor Girl:** The legal aspects of teenage sexuality have undergone several changes since colonial times. The age of consent has increased from 10 to 12 to 14 to 16 and finally to 18 years by the 2013 amendment, in order to bring it in conformity with the then newly legislated POCSO Act.
 - The law disregards the likelihood of a minor girl engaging in sexual activity voluntarily — it thus desexualises her.
- **Ignores Social Reality:** The law that criminalises adolescent sexuality either ignores social reality or pretends to do so. According to the [NFHS-5](#), for instance, 39% women had their first sexual experience before turning 18.
 - The same survey provides additional evidence of sexual engagement among unmarried adolescent girls by reporting contraception use by 45% of unmarried girls in the age group of 15-19 years.
- **Government Acting as Parens Patriae:** The recent criminal law amendment in state of Uttar Pradesh (under this, the accused in cases of rape and POCSO will not get anticipatory bail) rubs salt on the already wounded.
 - The state seems to be acting as **parens patriae** to protect children from sexual offences and paradoxically prosecuting the youth at the same time.
- **Burdens Already Overburdened Courts:** The number of juveniles (especially those between the ages of 16 and 18) apprehended under the POCSO Act in the country has seen a staggering jump of 180% between 2017- 2021 according to the National Crime Records Bureau’s report, ‘Crime in India 2021’.
 - Criminalising underage sexuality (25% of total POCSO cases) burdens the already-overburdened courts thereby clogging up the criminal justice machinery even more.
- **Undermines the Victim’s Privacy:** The cumulative victimisation of the “consenting” girl also deserves the lawmakers’ attention. POCSO, [MTP \(Medical Termination of Pregnancy\) Act](#) and the [Child Marriage Act](#) create a complex socio-legal web that deprives the minor girl of the rights to dignity, liberty, sexual and reproductive health, and undermines her privacy. This also feeds into a milieu of poor sexual awareness among young girls.

What are Judicial Interventions in this Case?

- **Demarcating the Nature of Acts:** What has been set wrong by the legislature has been attempted to be remedied by the judiciary. The **Madras High Court in Vijayalakshmi v State (2021)** made it imperative to draw a line demarcating the nature of acts that should not be made to fall within the scope of this stringent law.
 - The obiter of the court that POCSO has become a tool in the hands of certain sections of

society to abuse the process of law is corroborated by other courts too.

- Prima facie the judiciary seems to have a sympathetic approach in cases — it has readily granted bail where the outcome of the love affair is marriage.
- In ***Dharmendra Singh v State Govt of NCT (2020)***, the Delhi High Court has attempted to increase the chances of bail of an accused in an “innocent yet unholy physical alliance” or where there is “tacit approval-in-fact” by the girl and the “age difference between the victim and the offender is less”.
- Recently, Karnataka High Court, while dismissing a case filed under the Protection of Children from Sexual Offences Act, 2012 (POCSO Act), said the Law Commission of India will have to rethink the age of consent for Adolescents.
 - The court said, the aspect of consent by a girl of 16 years, but who is below 18 years, would have to be considered, if it is indeed an offense under the Indian Penal Code and/or the POCSO Act.

What should be the Way Forward?

- **Training for Investigating Officers:** Investigating officers **should be provided with proper training on the handling of POCSO cases.** This can include **training on the proper techniques for collecting and preserving evidence**, interviewing child victims and witnesses, and the legal requirements of the POCSO Act.
 - Eg. the Tamil Nadu police guidelines directing police personnel to not act hastily when arresting youngsters for romantic cases under POCSO is one intervention to address the Act’s tendency to overcriminalise.
- **Revising the act:** Revising and updating the POCSO Act in order to address the changing needs and realities of modern society is important in order to ensure that the act continues to serve the needs of children and promote their rights and well-being.
 - In a recent speech at the Delhi Commission for Protection of Child Rights, former Supreme Court judge, Justice Madan Lokur talked about the need to evolve a separate procedure for children while dealing with POCSO cases.
- **Harmonizing the age of consent for sexual activity** with the age of consent for marriage, which is 21 for males and 18 for females, would help to reduce confusion and promote greater consistency across different areas of law.
- **Promoting positive and comprehensive sexuality education:** Promoting positive and comprehensive sexuality education, including education about consent, would help to reduce the incidence of sexual offences against children and promote greater understanding of the issue among young people and wider society.
- **Improving data collection and analysis:** Improving data collection and analysis, including through the establishment of a centralized database of reported cases, would help to better understand the extent of the problem and to identify areas for improvement in the legal process.

UPSC Civil Services Examination Previous Year Question (PYQ)

Q. With reference to the United Nations Convention on the Rights of the Child, consider the following: (2010)

1. The Right to Development
2. The Right to Expression
3. The Right to Recreation

Which of the above is/are the Rights of the child?

- (a) 1 only
- (b) 1 and 3 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Ans: (d)

Exp:

- The United Nations (UN) took its first step towards declaring the importance of child rights by establishing the United Nations International Children's Emergency Fund (UNICEF) in 1946. In 1948, the UN General Assembly adopted the Universal Declaration of Human Rights, making it the first UN document to recognise children's need for protection.
- The first UN document specially focused on child rights was the Declaration on the Rights of the Child, but instead of being a legally binding document it was more like a moral guide of conduct for governments. It was not until 1989 that the global community adopted the United Nations Convention on the Rights of the Child, making it the first international legally binding document concerning child rights.
- The convention, which came into force on the 2nd September 1990, consists of 54 articles covering various categories of child rights including right to life, right to development, right to engage in play and recreational activities, right to protection, right to participation, expression, etc. **Hence, 1, 2 and 3 are correct.**
- **Therefore, option D is the correct answer.**

[Source: TH](#)

Early Warning System in Himalayan Region

For Prelims: Earthquakes, Sendai Framework (2015-2030), Floods, Rockslides, Avalanches, Tsunami, Drought, Disaster Management.

For Mains: Early Warning Systems and its Significance.

Why in News?

Recently, the National Geophysical Research Institute (NGRI) of the Council of Scientific and Industrial Research (CSIR) has begun field studies to put in place an [Early-Warning System](#) in **the Himalayan states against major and sudden floods, rockslides, landslips, glacier lake bursts and avalanches.**

What are the Early Warning Systems?

- **Early Warning System is an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment,** communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.
- It helps **reducing harm to people and damage to assets ahead of impending hazards,** including [storms](#), [tsunamis](#), [droughts](#), and heatwaves, to name a few.
- Multi-hazard early warning systems **address several hazards that may occur alone or simultaneously.**
 - Increasing the availability of multi-hazard early warning systems and disaster risk information is one of seven global targets set by the [Sendai Framework for Disaster Risk Reduction 2015-2030](#).

What are India's Efforts in Managing Disaster?

- **Establishment of NDRF:**
 - India has increasingly mitigated and responded to all types of disasters, including with the establishment of its [National Disaster Reaction Force \(NDRF\)](#), the world's largest rapid reaction force dedicated to disaster response.
- **Establishment of NDMA:**
 - The [National Disaster Management Authority \(NDMA\)](#), headed by the Prime Minister of India, is the apex body for Disaster Management in India. Setting up of NDMA and the creation of an enabling environment for institutional mechanisms at the State and District levels is mandated by the **Disaster Management Act, 2005**.
 - It lays down policies on disaster management
- **India's Role as a Foreign Disaster Relief:**
 - India's foreign humanitarian assistance has increasingly included its military assets, primarily deploying naval ships or aircraft to deliver relief.
 - In line with its diplomatic policy of "[Neighbourhood First](#)," many of the recipient countries have been in the region of South and Southeast Asia.
- **Contribution to Regional Disaster Preparedness:**
 - Within the context of the [Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation \(BIMSTEC\)](#), India has hosted DM Exercises that allow NDRF to demonstrate for counterparts from partner states the techniques developed to respond to various disasters.
 - Other NDRF and Indian Armed Forces exercises have brought India's first responders into contact with those from states in the [South Asian Association for Regional Cooperation \(SAARC\)](#) and the [Shanghai Cooperation Organisation \(SCO\)](#).
- **Managing Climate Change related Disaster:**
 - India has adopted the **Sendai Framework for Disaster Risk Reduction, the Sustainable Development Goals (2015-2030)**, and the [Paris Agreement](#) on Climate Change, all of which make clear the connections among DRR, Climate Change Adaptation (CCA), and sustainable development.

UPSC Civil Services Examination, Previous Year Question

Q. Describe various measures taken in India for Disaster Risk Reduction (DRR) before and after signing 'Sendai Framework for DRR (2015-30)'. How is this framework different from 'Hyogo Framework for Action, 2005'? (2018)

[Source: TH](#)

New Norms for TV Channels

Why in News?

Recently, the Ministry of Information & Broadcasting has issued guidelines and specified new uplinking and downloading rules.

- Earlier, the Ministry of Information and Broadcasting (I&B) had issued an [advisory stating that any kind of broadcasting](#) be done only through Prasar Bharti.

What are the New Provisions?

▪ **Obligation to Telecast Content in National/Public Interest:**

- Television channels will have to telecast content in the national interest or public service every day for 30 minutes.
 - Nonetheless, these obligations will not be applicable for **sports, wildlife, and foreign channels.**
- The **themes of national importance** include,
 - Education and spread of literacy
 - Agriculture and rural development,
 - Health and family welfare,
 - Science and technology,
 - Welfare of women
 - Welfare of the weaker sections of society
 - Protection of the environment and of cultural heritage and national integration.

▪ **No prior Permission for Live Telecast of Events:**

- Requirement for seeking permission for live telecast of events has been done away with, only prior registration of events to be telecast live would be necessary,
- No requirement of prior permission for change of language or conversion of mode of transmission from Standard Definition (SD) to High Definition (HD) or vice versa, only prior intimation would be required.

▪ **Indian Teleports may Uplink Foreign Channels:**

- LLPs / companies would be allowed to uplink foreign channels from Indian teleports which would create employment opportunities and make India a Teleport-hub for other countries.

▪ **Simplification and Rationalization:**

- Structure of the Guidelines has been systematized to avoid duplication and common parameters.
- The penalty clauses have been rationalized and separate nature of penalties have been proposed for different types of contraventions as against uniform penalty at present.

[Source: TH](#)

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