DAILY CURRENT AFFAIRS 26-10-2024

GS-1

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3. **eShram portal**

GS-3

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Enhanced Rock Weathering

Syllabus: GS-1; Geography

Context

- Company uses mining dust to enhance carbon capture

About

- **Enhanced Rock Weathering (ERW)** is a carbon dioxide removal (CDR) technique that accelerates the natural process of weathering to capture atmospheric CO_2.
- This method involves spreading finely ground silicate rocks, particularly basalt, over large areas of land.
- When these rocks chemically react with CO_2 in the atmosphere, they form stable carbonate minerals, effectively removing CO_2 from the air.

Key Points:

- **Natural Process**: Rock weathering is a natural process in which silicate rocks break down over time through reactions with carbon dioxide and water. Enhanced rock weathering speeds up this process.
- **Carbon Sequestration**: The carbon captured through the weathering process forms carbonate compounds that are stable for long periods, potentially for thousands of years.
- **Primary Rocks Used**: Basalt, a silicate-rich rock, is one of the most commonly used in ERW because of its high weathering rate and the availability of minerals that can react with CO_2.
- **Application**: ERW is typically applied to agricultural soils, which have the added benefit of increasing soil fertility as weathered rock releases beneficial minerals like calcium, magnesium, and potassium.
- **Environmental Benefits**:
    - **Soil Health**: Enhances nutrient availability and improves soil structure.
    - **Ocean Acidification**: By capturing atmospheric CO_2, ERW reduces the amount of CO_2 dissolving into the oceans, thus helping to mitigate ocean acidification.

Example: Alt Carbon

- The last thing you might expect is that dust from mining could be climate-friendly.

- However, **Alt Carbon**, a Darjeeling-based company, is leveraging this process to fight climate change.
- The company's core business involves using basaltic rock dust, a byproduct of mining, to sequester carbon and has already garnered $500,000 in investments from carbon-credit companies.
- **Basaltic Rock**: Rich in calcium and magnesium, basalt is mined from areas such as the **Rajmahal Traps** in Jharkhand and West Bengal.
- Once crushed into fine powder, the surface area of the rock increases, accelerating carbon capture through the formation of bicarbonates, which eventually flow into oceans where the carbon is locked for aeons.
- **Rapid Sequestration**: Enhanced rock weathering can speed up this process significantly.
- For instance, spreading crushed basalt dust over tea estates in Darjeeling has demonstrated that 3-4 tonnes of dust can sequester a tonne of carbon in 2-4 years, compared to natural processes that take around 1,000 years.
- **Carbon Credits**: Each tonne of sequestered carbon counts as a carbon credit.
- Alt Carbon has entered agreements with major organizations like Frontier (a consortium including McKinsey Sustainability, Alphabet, Meta, Shopify, and Stripe) and **NextGen** to sell these credits, with current market rates at $200 per tonne.

Advantages of Enhanced Rock Weathering:

- **Scalability**: Since silicate rocks like basalt are abundant and can be spread over wide agricultural areas, ERW has potential for large-scale deployment.
- **Co-benefits for Agriculture**: In addition to capturing carbon, ERW can improve crop yields by enriching soils with essential nutrients.
- **Durability**: The carbon stored via ERW is considered stable, as it is converted into long-lasting carbonates.

Challenges:

- **Cost and Energy Use**: Mining, grinding, and transporting large amounts of rock can be energy-intensive and costly.
- **Monitoring and Verifiability**: While the principle of enhanced rock weathering is well established, there are still questions around accurately measuring the sequestered carbon. Studies show varying results depending on factors like the type of rock, climate, and agricultural fields.

Research and Development:

- ERW is an area of active research and development, with companies like Alt Carbon leading the way by investing in both science and infrastructure.
- As the world seeks solutions to reduce atmospheric CO_2, ERW is positioned as a promising technique with significant long-term potential.

What do the Atlantic Ocean hurricane forecasts foretell for India?

Syllabus: GS-1; Geography

Context

- This piece highlights the evolving challenges in predicting and managing cyclones in the face of climate change, particularly in the Indian subcontinent.

Key Points

- **Unexpected Hurricane Season in 2024**:
  - A strong La Niña was expected to drive a historic hurricane season, but the season has been unexpectedly quiet, with fewer hurricanes.
  - Forecasts for La Niña have been downgraded, showing the unpredictability of cyclone patterns.
- **Impact of Record Warming (2023-2024)**:
  - The warm conditions during 2023-2024 could be altering the typical relationship between hurricanes and climate phenomena like El Niño and La Niña.
  - Hurricanes Helene and Milton raised concerns, but major hurricanes remained absent.
- **Challenges in Forecasting Cyclones**:
  - While forecasting technology has improved, especially in predicting landfall, major difficulties remain in forecasting cyclone intensities and their post-landfall effects.
  - This is particularly concerning as post-landfall rain and winds can cause significant damage.

- **Increasing Strong Cyclones and Rapid Intensification**:
  - Historical data shows no significant increase in the number of cyclones, but a rise in the intensity of strong cyclones has been observed due to warming upper oceans.
  - Rapid intensification, where wind speeds increase dramatically in a short time, remains difficult to predict.
- **North Indian Ocean Cyclones**:
  - The North Indian Ocean, particularly the Arabian Sea, has seen an increase in cyclone activity.
  - Predicting cyclone numbers and their post-landfall behavior remains challenging due to the impact of global warming.
- **Good, Bad, and Ugly for India**:
  - **Good**: India has made significant progress in cyclone forecasting and disaster management, which has helped reduce loss of lives.
  - **Bad**: India is highly vulnerable to both chronic climate stressors (e.g., warming, sea level rise) and acute ones (e.g., cyclones, flash droughts).
  - **Ugly**: India's economic development is closely tied to its ability to manage climate risks, which also impact national security. Coordination with neighboring countries is essential for regional stability and resilience.
- **Forecasting and Hyperlocal Risk Maps**:
  - There's a need for hyperlocal cyclone risk maps, as India's economic development will depend on managing resources efficiently.
  - These maps could help prioritize high-risk areas for better mitigation and adaptation efforts.

eShram portal

Syllabus: GS-1; Social Security, GS-2; Government policies and Interventions

Context

- The second version of the eShram portal will be launched with new features like eligibility criteria for various welfare schemes, Union Labour Minister Mansukh Mandaviya said.

More to know

- **eShram Portal 2.0** is an updated version of the original eShram portal, launched by the Government of India to provide social security to unorganized sector workers.
- The portal has undergone various improvements to enhance its functionality and widen the scope of benefits for workers in the informal sector.

Key Features of eShram Portal 2.0

- **Objective**:
  - The portal aims to build a comprehensive database of workers in the unorganized sector to ensure they have access to various government welfare schemes.
  - It is designed to support policy-making for the upliftment of unorganized sector workers.
- **Target Group**:
  - Workers in sectors like construction, agriculture, domestic work, street vendors, and other unorganized industries.
  - The portal is especially helpful for migrant workers, helping track and ensure their welfare.
- **Universal Account Number (UAN)**:
  - Every registered worker is provided with a UAN (Universal Account Number), which is portable and can be used across India.
  - This number ensures workers can access social security benefits even if they move to different parts of the country.
- **Registration Process**:
  - Workers can self-register on the portal via the eShram website using their Aadhaar card and bank account details.
  - Assistance for registration is also available at Common Service Centers (CSCs).
- **Integration with Welfare Schemes**:
  - eShram 2.0 is integrated with multiple welfare schemes such as **Pradhan Mantri Shram Yogi Maan-Dhan (PMSYM)** and **Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)**.
  - It provides health and life insurance coverage and pensions to eligible workers.
- **Improvements in Version 2.0**:
  - Enhanced user interface and better accessibility, making it easier for workers to navigate and use the portal.

- Integration with Aadhaar-enabled biometric identification for better data accuracy and to prevent duplications.
- More streamlined grievance redressal mechanisms.

- **Social Security**:
  - eShram Portal 2.0 focuses on ensuring access to health, pension, and insurance benefits for workers and their families.
  - The portal acts as a bridge for workers to get enrolled in various social security programs.
- **Skill Development & Employment Opportunities**:
  - eShram Portal 2.0 is linked with skill development initiatives and employment generation schemes to improve job prospects for unorganized sector workers.

Satellite spectrum

Syllabus: GS-3; Science and Technology

Context

- Allocating satellite spectrum: Jio vs Starlink spat and why most countries avoid auctions
- Their essential argument is that administrative allocation may not be able to bring about a level playing field between satellite and terrestrial services.

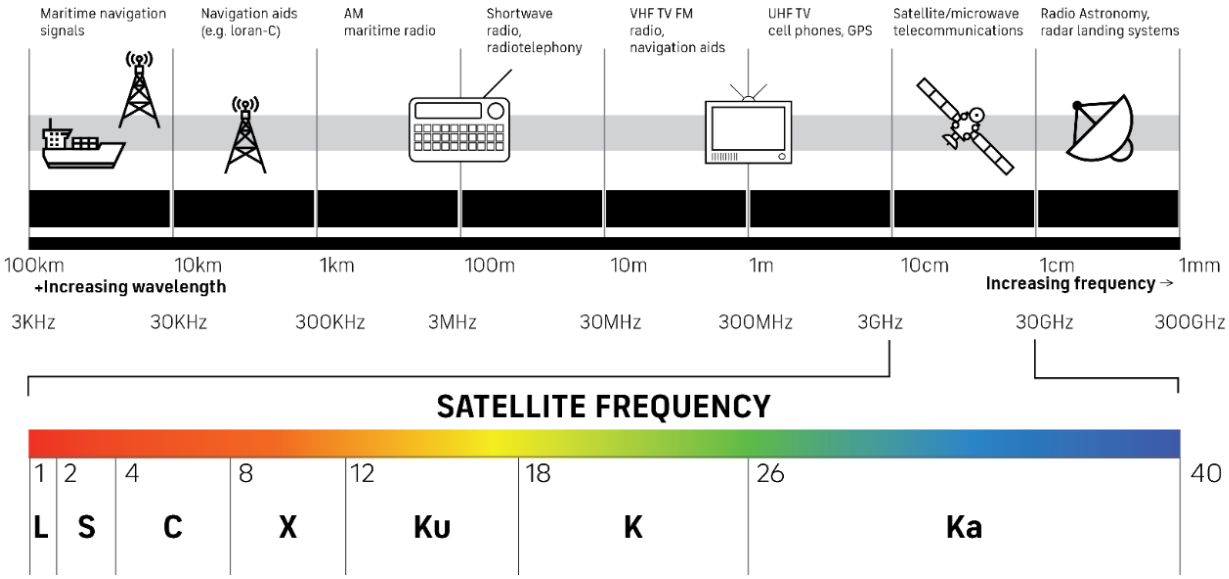
About

- **Satellite Spectrum** refers to the range of electromagnetic frequencies used by satellites for communication, broadcasting, and data transmission.
- It's crucial for maintaining connectivity in areas like broadcasting, GPS, defense, and global telecommunications.

Frequency Bands Used in Satellite Communication:

- **L Band (1–2 GHz)**: Used for GPS, mobile satellite services, and aircraft communication.
- **S Band (2–4 GHz)**: Utilized for weather radars, satellite phones, and some communication satellites.
- **C Band (4–8 GHz)**: Widely used for satellite television, long-distance communication, and satellite internet.

- **X Band (8–12 GHz)**: Primarily used for military communication and radar systems.
- **Ku Band (12–18 GHz)**: Frequently used for satellite television, internet, and communication services.
- **Ka Band (26–40 GHz)**: Provides high-capacity internet services and advanced communications.



Importance of Satellite Spectrum:

- **Global Communication**: Ensures seamless global communication, including internet services in remote areas.
- **Broadcasting**: Supports television and radio broadcasting across vast geographical regions.
- **Defense**: Critical for military communication, navigation, and intelligence gathering.
- **Weather Forecasting**: Satellites help in monitoring weather patterns and natural disasters using specific frequencies.

Regulation of Satellite Spectrum:

- **International Telecommunication Union (ITU)**: A specialized agency of the United Nations responsible for allocating global radio spectrum and satellite orbits.
- **National Spectrum Allocation**: Each country allocates spectrum for its satellite services, often regulated by national authorities like the Telecom Regulatory Authority of India (TRAI).

Challenges in Satellite Spectrum Management:

- **Spectrum Congestion**: Increasing demand for communication services can lead to congestion in certain bands.
- **Interference**: Overlapping signals from different services can cause interference, reducing communication quality.
- **Geopolitical Issues**: Disputes between nations over satellite orbital slots and spectrum allocation.

India's Satellite Communication and Spectrum Use:

- **5G and Satellite**: With 5G rollout, satellite spectrum is also being considered for ensuring better connectivity in remote regions.

India's Space Communication:

- **GSAT series**: India's satellites, like GSAT (Geostationary Satellites), use different bands of the spectrum for communication.
- **INSAT**: The Indian National Satellite System also uses various frequency bands for broadcasting, telecommunications, and weather data collection.
- **INSAT/GSAT Satellites**: India's satellite systems use C, Ku, and Ka bands for a variety of communication services, including DTH (Direct-to-Home) and internet services.
- **Role of ISRO**: The **Indian Space Research Organisation (ISRO)** plays a key role in launching communication satellites and managing satellite-based services in India.

Technological Advancements:

- The growing demand for high-speed data and internet services has increased reliance on **high-throughput satellites (HTS)**, which use more efficient spectrum management to increase data capacity.
- **5G and Satellites**: The upcoming 5G networks will rely on satellite communication to provide coverage in remote and inaccessible areas.

Global Initiatives:

- **Starlink, OneWeb**: Global companies like SpaceX (Starlink) and OneWeb are launching satellite constellations for global internet coverage, increasing the demand for satellite spectrum.

Future Trends:

- **Low Earth Orbit (LEO) Satellites**: LEO satellites, like Starlink, are expected to revolutionize broadband services, especially in underdeveloped regions.
- **Spectrum Sharing**: Techniques to share the same spectrum between terrestrial and satellite systems are being explored to manage congestion.

Crackers ban in Delhi

Syllabus: GS-3; Environmental Governance

Context

- The Delhi High Court has recently directed the licensed firework dealers to refrain from selling any firecrackers in the national capital until January 01, 2025.

More to know

- Delhi has enforced a ban on the sale, use, and storage of firecrackers in recent years, particularly during festivals like Diwali, to combat severe air pollution, which worsens during the winter season.

Background

- **Air Pollution in Delhi:**
  - Delhi faces hazardous levels of air pollution, especially during the winter months. Particulate matter (PM2.5 and PM10) levels rise significantly due to meteorological conditions, crop stubble burning, vehicular emissions, and industrial activities.
  - Firecrackers contribute to the spike in air pollution during Diwali, resulting in respiratory problems, especially among vulnerable groups like children and the elderly.
- **Supreme Court Rulings:**
  - The Supreme Court has played a key role in regulating the use of firecrackers, citing health concerns due to air quality deterioration.
  - In 2018, the Court allowed the use of "green crackers" but emphasized the need for regulation of traditional crackers.

Government Action

- **Delhi Government's Ban:**
  - The Delhi government, under the Aam Aadmi Party (AAP), imposed a **complete ban on the sale, use, and storage of firecrackers** during the Diwali season in 2020, 2021, and 2022, continuing in 2023 and beyond.
  - This ban is usually implemented from September to January, coinciding with the period when air quality typically deteriorates.
- **Penalties:**
  - Strict fines and penalties are imposed for violations of the firecracker ban, including jail terms, to ensure compliance.
- **Green Crackers:**
  - Despite the promotion of green crackers, their availability has been limited. These crackers are less harmful but still contribute to pollution.

Health and Environmental Impact

- **Respiratory Illnesses:**
  - Delhi witnesses a sharp rise in respiratory illnesses such as asthma, bronchitis, and other lung-related conditions during and after Diwali, particularly due to the emissions from firecrackers.
- **Air Quality Index (AQI):**
  - Firecracker usage during festivals like Diwali causes a spike in Delhi's AQI, often pushing it into the **"severe"** category, where the pollution levels are 10 times higher than safe limits.
- **Environmental Degradation:**
  - Noise pollution caused by firecrackers, combined with the high particulate matter, contributes to environmental degradation.

Legal and Public Response

- **Legal Challenges:**
  - The ban has faced opposition from the firecracker industry and certain groups, citing economic losses and religious traditions.
  - Various petitions have been filed against the ban, but the courts have upheld the Delhi government's decision, prioritizing public health over other concerns.
- **Public Awareness Campaigns:**

- The Delhi government has launched awareness campaigns encouraging residents to celebrate Diwali without crackers. Alternatives like laser light shows and community events are promoted.

- **Mixed Public Reactions:**
  - While many support the ban due to environmental concerns, others oppose it, viewing it as an infringement on cultural practices.

Role of Central Agencies and National Green Tribunal (NGT)

- The **National Green Tribunal (NGT)** has actively supported the firecracker ban in Delhi and other pollution-prone areas across North India. The tribunal emphasized the need for stringent measures to control seasonal pollution spikes.
- The **Central Pollution Control Board (CPCB)** provides real-time air quality monitoring and issues advisories based on pollution levels.