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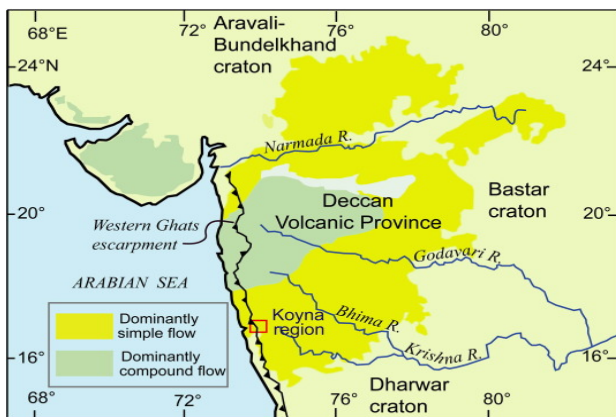
INDIA'S MISSION TO DRILL A 6-KM DEEP HOLE IN KOYNA, MAHARASHTRA

Context

- Recently, the **Union Ministry of Earth Science** decided scientific **deep drilling in the Koyna region** of Maharashtra, aiming for an indispensable progress in the earth sciences.

About the Koyna-Warna Region: A Seismic Hotspot

- It is a region nestled in the Western Ghats of Maharashtra, and has been prone to earthquakes.



- Since the impoundment of the **Shivaji Sagar Lake (better known as the Koyna Dam)** in 1962, this area has experienced **recurrent seismic activity**.
- These earthquakes are particularly intriguing because they occur within the **interior of tectonic plates**, away from the well-known plate boundaries.
 - Earthquakes** are the sudden, powerful shifts in our planet's crust—remain enigmatic phenomena.

Role of Scientific Deep-Drilling

- It involves strategically boring boreholes into the Earth's crust to observe and analyze its deeper layers.
- It provides unique insights into various aspects of our planet, including earthquakes.
 - Countries** like the **United States, Russia, and Germany** have previously undertaken such projects, and now India joins their ranks.

India's Borehole Geophysics Research Laboratory (BGRL)

- It was established by the **Union Ministry of Earth Sciences** in **Karad, Maharashtra**.
- It aims to **execute India's sole scientific deep-drilling program**, currently working on their ambitious goal, i.e. drill down to a depth of 6 kilometers (that's roughly 3.7 miles) in the **Koyna-Warna region**.

Drilling Techniques used at the Koyna Pilot Borehole

- The Koyna borehole employs a **Hybrid Approach**, combining two well-established drilling techniques: **Rotary Mud Drilling** and **Percussion Drilling** Techniques (also known as **Air Hammering**).
 - The Koyna borehole rig is versatile, capable of both mud rotary and air hammering techniques.
 - The choice of technique depends on site-specific factors, such as rock type, fractures, and the need for core samples.
 - Core Samples:** Collecting core samples from geological fault zones is crucial for earthquake studies.

Challenges of Drilling

Up to 3 Kilometers	Up to 6 Kilometers
<ul style="list-style-type: none"> Dynamic (Real-Time) Decision-Making based on geological conditions, rock properties, and safety considerations. Core Sampling Dilemma in Mud Rotary and Air Hammering Techniques Geophysical Well Logging Challenges that involve downhole measurements of physical and chemical properties using specialized probes like: 	<ul style="list-style-type: none"> Rig Capacity Upgrade, as we venture beyond the 3-kilometer mark Complexities of Fractured Rocks, as risk of drill rods and sensors getting stuck becomes more pronounced. Troubleshooting in the Abyss: At these depths, instruments, probes, and cables face constraints.

<ul style="list-style-type: none"> ◆ Temperature ◆ Density ◆ Electrical Conductivity ◆ Sonic Velocity ◆ Rock Porosity, and ◆ Radioactivity. • Steel Casing Installation to secure the borehole walls and Hook Load Capacity Limitation. 	<ul style="list-style-type: none"> • Weighty Cores and Lifting Feats: Operators need Herculean strength and precision. • Frequent Fault Lines and Water Intrusion, and Abandonment Conundrum • Steering the Borehole: Imagine guiding a needle through fabric, but the fabric is kilometers of Earth's crust. • Special equipment—drill motors, imaging tools, and minute-tuning monitoring devices—become their trusty companions.
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Unraveling Earthquake Mysteries: Why Drill So Deep?

- **Reservoir-Triggered Earthquakes:** The Koyna Dam's impoundment significantly altered the stress distribution in the Earth's crust.
 - ◆ As water fills the reservoir during monsoons and releases afterward, it affects the underlying rocks.
 - ◆ This dynamic loading and unloading provide a unique opportunity to study reservoir-triggered earthquakes.
- **Understanding Earthquake Mechanisms:** By reaching depths of 6 kilometers, scientists hope to directly observe the active fault zone responsible for seismic activity.
 - ◆ It can help us better understand the mechanisms behind earthquakes and potentially improve prediction models.
- **Expanding Our Geological Knowledge:** Beyond earthquakes, deep-drilling allows us to explore rock types, energy resources, climate change patterns, and even the evolution of life.
- India and Austria have agreed to a future-oriented **“bilateral sustainable economic and technology partnership”**.
- The Prime Minister's visit to Vienna, accompanying Foreign Minister and National Security Advisor, signals a **robust intent to deepen and broaden bilateral ties**.

Overview of India- Austria Relations

Source: TH

INDIA-AUSTRIA: 75 YEARS OF DIPLOMATIC RELATIONS

Context

- Recently, the Prime Minister paid an official visit to Austria.

About

- This was the Prime Minister's first visit to Austria and that of an **Indian Prime Minister after 41 years**.
- This year marks the **75th year of diplomatic relations** between the two countries.
- **Political Relations:** Diplomatic relations between India and Austria were **established in 1949**.
 - ◆ In 1953, India intervened in favour of Austria during its negotiations with the Soviet Union on the State Treaty of Austria that resulted in the independence of Austria in 1955.
 - ◆ The relationship between India and Austria has historically been cordial, yet underexplored.
- **Economic Relations:** India is now considered one of Austria's most important trading partners outside the EU, with a trade volume of EUR 2.7 billion.
 - ◆ Austrian direct investment in India amounted to EUR 733 million at the end of 2023, while Indian investment in Austria recently reached EUR 1.6 billion.
 - ◆ The new EU Commission wants to negotiate a free trade agreement with India during this term.
 - ◆ Such an agreement would not only facilitate access to the EU common market but would also expand regulated labour migration to Austria.
- **Space:** Austria's first two satellites TUGSAT-1/ BRITE and UniBRITE were launched by India's PSLV-C20 from Satish Dhawan Space Centre.

Austria

- Austria is a **largely mountainous landlocked country** of south-central Europe.
- Together with Switzerland, it forms what has been characterized as the **neutral core of Europe**.
- It is bordered to the north by the **Czech Republic**, to the northeast by **Slovakia**, to the east by **Hungary**, to the south by **Slovenia**, to the southwest by **Italy**, to the west by **Switzerland and Liechtenstein**, and to the northwest by **Germany**.



Analysis of Relations

- India has played a very **important and mediating role** on the world stage in the recent past, particularly at the recent G20 Summit.
- India continues to navigate a **delicate balance between the West and Russia**, positioning itself as a **bridge-builder between the East and West**. This strategy is crucial for India, particularly in asserting itself against China.
- In this context, **Austria serves as a strategic destination** for India in Europe, **maintaining neutrality since 1955**, with historical ties to both the Soviet Union and Russia.
- Despite ongoing tensions, **Austria's relations with Russia remain economically significant** due to substantial Russian investments, heavy reliance on Russian gas, and extensive financial networks.
- In the Global South, **India holds a unique and credible position**, further enhancing its role as a mediator on the global stage.

Way Ahead

- Prime Minister Modi's visit to Austria offers a **significant opportunity to strengthen bilateral relations**.
- The **India-Middle East-Europe corridor** will open additional trade routes, including to Austria, thus **strengthening economic and trade ties**.

- These developments offer a **wide range of opportunities for cooperation** in the areas of technology, sustainable development and trade, from which both countries can benefit in the long term.

Source: IE

ADMINISTRATIVE ROLE OF J&K L-G

Context

- Recently, the Union Ministry of Home Affairs (MHA) amended the Rules to widen the administrative role of Lieutenant Governor (L-G) of Jammu and Kashmir.

Key Changes

- **Police and Public Order:** The L-G now has more say in matters related to police and public order, aiming to strengthen the L-G's role in maintaining law and order within the Union Territory.
 - ♦ Any proposal requiring prior concurrence of the Finance Department in these areas must be placed before the L-G first.
- **All India Service (AIS):** Transfers and postings of AIS officers now fall under the L-G's purview. This change grants the L-G greater authority in managing the bureaucracy.
- **Legal Appointments and Prosecution:** Proposals regarding the appointment of the **Advocate-General, Law Officers**, and decisions on prosecution sanctions or appeals will now be submitted to the L-G for approval.
 - ♦ The Department of Law, Justice, and Parliamentary Affairs will play a crucial role in this process.
- **Prisons and Forensic Science:** Matters connected with Prisons and the Directorate of Prosecution and Forensic Science Laboratory will also be submitted to the L-G.

Lieutenant Governor

- A lieutenant governor serves as the **constitutional head** of five of India's eight union territories.
- The President of India appoints the lieutenant governor for a five-year term, and they serve at the President's pleasure.
- **Responsibilities:** The LG is the constitutional head of the UT, representing the President of India. Their role is largely ceremonial, similar to that of a Governor in a state.
 - ♦ The LG exercises **executive powers on the aid and advice of the Council of Ministers**,

headed by the Chief Minister. However, they have discretionary powers in certain matters, such as law and order, land, and police, which can lead to conflicts with the elected government.

- The LG can summon, prorogue, and dissolve the Legislative Assembly. They can also reserve certain bills for the President's consideration.
- The LG is responsible for the **administration of the UT** and can appoint administrators for various departments.

Challenges and Issues

- **Conflict with Elected Governments:** In UTs with legislative assemblies, there have been frequent conflicts between the LG and the elected government over the extent of their respective powers.
- **Ambiguity in Powers:** The constitutional provisions and laws defining the LG's powers are often ambiguous, leading to different interpretations and disputes.
- **Centralization of Power:** Critics argue that the LG's discretionary powers lead to centralization of power and undermine the autonomy of elected governments in UTs.

Source: TH

INDIA'S PROGRESS ON SDG INDIA INDEX 2023-24

In News

- Recently, NITI Aayog released SDG India Index 2023-24.

About SDG India Index 2023-24

- SDG India Index 2023-24, the fourth edition of the country's principal tool for measuring national and subnational progress on the Sustainable Development Goals (SDG)
- It measures and tracks national progress of all States and UTs on 113 indicators aligned to the Ministry of Statistics and Programme Implementation's (MoSPI) National Indicator Framework (NIF).
- **Methodology:** The SDG India Index computes goal-wise scores on the 16 SDGs for each State and UT. Overall State and UT scores or Composite Scores are generated from goal-wise scores to measure the aggregate performance of the sub-national unit based on its performance across the 16 SDGs.
 - ♦ These scores range between 0–100, and if a State/UT achieves a score of 100, it signifies it has achieved the targets. The higher the score of a State/UT, the greater the distance covered to the target.

The Sustainable Development Goals (SDGs): They were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.

- The 17 SDGs are integrated—they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability.



India's Progress

- India is progressing towards the Sustainable Development Goals despite global headwinds



- The **composite score** for India improved from **57 in 2018 to 66 in 2020-21 to further to 71 in 2023-24**
 - Noteworthy advancements have been observed in Goals 1 (No Poverty), 8 (Decent Work and Economic Growth), 13 (Climate Action). These are now in the 'Front Runner' category (a score between 65–99).
- Comparison** : Since 2018, India has witnessed substantial progress in several key SDGs. Significant progress has been made in Goals 1 (No Poverty), 3 (Good Health and Well-being), 6 (Clean Water and Sanitation), 7 (Affordable and Clean Energy), 9 (Industry, Innovation and Infrastructure) and 11 (Sustainable Cities and Communities).
- State wise** : Uttarakhand and Kerala have taken the top spot among states in NITI Aayog's SDG India Index 2023-24
 - Between 2018 and 2023-24, fastest moving States are Uttar Pradesh (increase in score by 25), followed by J&K (21), Uttarakhand (19), Sikkim (18), Haryana (17), Assam, Tripura and Punjab (16 each), Madhya Pradesh and Odisha (15 each)

Interventions facilitating SDG achievements

- Over 4 crore houses under the PM Awas Yojana (PMAY),
- 10 crore LPG connections under PM Ujjwala Yojana,
- Tap water connections in over 14.9 crore households under Jal Jeevan Mission
- Over 30 crore beneficiaries under Ayushman Bharat -Pradhan Mantri Jan Arogya Yojana
- Coverage of over 80 crore people under the National Food Security Act (NFSA)

- Direct Benefit Transfer (DBT) of ₹34 lakh crore made through PM-Jan Dhan accounts.
- The Skill India Mission has led to over 1.4 crore youth being trained and upskilled and has reskilled 54 lakh youth
- PM Mudra Yojana sanctioned 43 crore loans aggregating to ₹22.5 lakh crore for entrepreneurial aspirations of the youth besides Funds of Funds
- Emphasis on renewable energy resulted in an increase in solar power capacity from 2.82 GW to 73.32 GW in the past decade.
- Improvement in digital infrastructure with reduced internet data costs by 97% which has in turn positively affected and fostered financial inclusion

Issues

- Income and gender inequality were the SDGs which have seen a drop in the score.
- States not doing well have issues like sex ratio at birth.

Conclusion and Way Forward

- India bettered its performance in achieving sustainable development goals (SDGs) during 2023-24 with significant progress in eliminating poverty, economic growth and climate action.
- However, progress in addressing inequalities related with gender and income as well as access to equal opportunities needs to be addressed more effectively.
- Ending discrimination against women and girls is a basic human right and is a prerequisite for sustainable development.
- NITI Aayog is committed to supporting all the States and UTs in the localisation and acceleration of SDGs, an important barometer to measure progress towards Viksit Bharat @ 2047.

Source: PIB

NEWS IN SHORT

AHOM 'MOIDAMS'

Context

- Recently, the Ahom era 'Moidams' in Assam's Charaideo district, were recommended for UNESCO World Heritage status.

About the Ahom 'Moidams'

- The term '**Moidam**' refers to the **ancient mound-burial system** of the **Ahom Dynasty**, which ruled over Assam in northeastern India.

- These Moidams **serve as the final resting places for Ahom royalty**, preserving not only their mortal remains but also the cherished objects associated with them.
- **Charaideo Necropolis** are pyramid-like structures that silently narrate the saga of Ahom royalty, their legacies, and the passage of time, situated on elevated land.

UNESCO Recommendation

- The international advisory body **International Council on Monuments and Sites (ICOMOS)** recommended the inclusion of Ahom 'Moidams' in the prestigious **UNESCO World Heritage List**.
- ICOMOS evaluated a total of 36 nominations globally, including 19 new ones. Among these, the **Ahom Moidam stood out as India's sole applicant**.
- It marks a crucial step toward formal recognition by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Basis for Recommendation

- ICOMOS recommended the inscription of Moidams on the World Heritage List based on **Criteria (III) and (IV)**:
 - ♦ **Criterion (III)**: Moidams bear exceptional testimony to the Ahom cultural tradition and civilization, which has both lived and disappeared over time.
 - ♦ **Criterion (IV)**: They represent outstanding examples of a specific type of architectural ensemble—namely, the mound-burial system—that reflects significant stages in human history.

Source: TH

CONSTITUTION ASSASSINATION DAY

In News

- The government has decided to observe the 25th of June every year as '**Samvidhaan Hatya Diwas**'.

About Constitution Assassination Day

- On 25 June in 1975, former Prime Minister Indira Gandhi imposed an Emergency in the country which lasted until March 21, 1977.
- There was large-scale suspension of fundamental rights for the citizenry, detention and arrest of Opposition leaders and critics, and press censorship.
 - ♦ The **38th Amendment Act of 1975** also made declaration of a national emergency immune

to judicial review (this was later removed by the 44th Amendment Act of 1978).

- This day will commemorate the massive contributions of all those who endured the inhuman pains of the 1975 Emergency,

Do you know ?

- Under **Article 352 of the Constitution**, the President may, on the advice of the Cabinet headed by the Prime Minister, issue a proclamation of emergency if the security of India or any part of the country is threatened by "war or external aggression or armed rebellion".
- In 1975, instead of armed rebellion, the ground of "internal disturbance" was available to the government to proclaim an emergency. In its press note, the government said certain persons were inciting the police and armed forces to not discharge their duties
- This was the only instance of proclamation of emergency due to "internal disturbance". The two occasions in which an emergency was proclaimed earlier, on October 26, 1962, and December 3, 1971, were both on grounds of war.
- This ground of "internal disturbance" was removed by The Constitution (Forty-fourth Amendment) Act, 1978 by the Janata government that came to power after the Emergency.

Source:TH

INDIA SEIZES PAK-BOUND CONSIGNMENT OF BANNED CHEMICALS

Context

- India has seized Pakistan-bound consignment, consisting of **internationally banned chemicals** used for tear gas and riot control agents, from China at a port in Tamil Nadu.

About

- Chinese firm had shipped a consignment of "**Ortho-Chloro Benzylidene Malononitrile**" to Pakistan.
- The chemical consignment was seized under the **provisions of the Customs Act, 1962**, and the **Weapons of Mass Destruction and Delivery Systems (Prohibition of Unlawful Activities) Act, 2005**.

- Ortho-Chloro Benzylidene Malononitrile (CS) is a listed substance under the **Wassenaar Arrangement**.
 - ♦ **India is a signatory to the Wassenaar Arrangement**, China and Pakistan are not.

Multilateral Export Control Regimes

- **Wassenaar Arrangement:** Established in **1996**, this regime focuses on conventional weapons and dual-use goods and technologies (items with both civilian and military applications).
 - ♦ It establishes lists of items for which member countries are to apply export controls.
- **Nuclear Suppliers Group:** Formed in **1974**, this regime seeks to prevent nuclear proliferation by controlling the export of materials, equipment, and technology that can be used to manufacture nuclear weapons.
- **Australia Group:** It was established in **1985** prompted by Iraq's use of chemical weapons during the Iran-Iraq War (1980-1988).
 - ♦ Australia, concerned with Iraq's development of chemical weapons, recommended harmonization of international export controls on chemical weapons precursor chemicals.
- **Missile Technology Control Regime:** Founded in **1987**, this regime aims to limit the proliferation of missiles and unmanned aerial vehicles capable of delivering weapons of mass destruction.
 - ♦ India joined the **MTCR in 2016**.

Source: BS

OWNERSHIP OF COMPUTER EMERGENCY RESPONSE TEAM (CERT-IN)

Context

- Two key ministries, **Information Technology and Home Affairs**, are making a strong pitch for the ownership of Computer Emergency Response Team (Cert-In), the country's nodal cybersecurity watchdog.
 - ♦ At present, Cert-In comes under the **administrative control of the IT Ministry**.

About the Indian Computer Emergency Response Team (CERT-In)

- It is an **office**, established in 2004, **within the Ministry of Electronics and Information Technology** of the Government of India.
- It's the national nodal agency for handling computer security incidents.

- It is **dedicated to preventing, detecting, and responding to cybersecurity incidents**.
- It plays a crucial role in incident reporting and alerting organizations about malware. Its **technical expertise** is invaluable in safeguarding **India's digital infrastructure**.

Why do CERTs Matter?

- **Rapid Response:** When a cyber attack strikes, time is of the essence. CERTs leap into action, minimizing damage and restoring order.
- **Collaboration:** They're not lone wolves. CERTs collaborate globally, sharing threat intel and best practices. It's like a digital Avengers team-up.
- **Prevention:** CERTs help us stay one step ahead. Their alerts and guidelines keep us informed and secure.

Key Players Involved and Associated Challenges

- **Information Technology (IT) Ministry:** Currently, CERT-In operates under the **administrative umbrella** of the IT Ministry.
 - ♦ **The Information Technology (Amendment) Act 2008**, designated CERT-In to serve as the **national agency** to perform key functions in the area of cybersecurity including the *collection, analysis and dissemination of information on cyber incidents; forecast and alerts of such events; prescribing emergency measures for handling them; and coordinating cyber incident response activities, among other things*.
- **Home Affairs Ministry (MHA):** The MHA, with its broader law enforcement mandate, believes that bringing CERT-In directly under its control would enhance investigative capabilities in cyberspace.

Source: IE

TIME CRYSTAL

Context

- Physicists have created **'Impossible' Time Crystal** by **Blasting Atoms Into Balloons**.

About

- By **blasting rubidium atoms with lasers**, physicists have excited them into a **puffy Rydberg state** in an experiment that results in the **exotic state of matter known as a time crystal**.
 - ♦ This new kind of time crystal has been generated from a **room-temperature gas of rubidium atoms** confined in a glass container.

- **First proposed in 2012** by the Nobel-prize-winning physicist **Wilczek**, time crystals are **groups of particles that repeat in time**, much like other crystals (such as table salt or diamonds) repeat in space.
- **Significance:** This opens up a new way to explore the properties of time crystals, as well as phenomena such as quantum fluctuations, correlation, and synchronization – an important factor in **designing quantum computers**.

Source: SA

