

My Notes....

NATIONAL

CENTRE EMPOWERED TO DEMONETISE

The **Supreme Court** said on 2 January 2022 the **Centre is empowered to demonetise 'all' series of bank notes** under **Section 26(2) of the RBI Act**. A five-judge Constitution bench headed by **Justice S A Nazeer**, which upheld the **Centre's 2016 demonetisation** of Rs 1,000 and Rs 500 currency notes by a **4:1 majority verdict**, said a statute must be construed having regard to the **legislative intent**.

More about verdict

1. The power available to the Central Government under **sub-section (2) of Section 26** of the **RBI Act** cannot be restricted to mean that it can be exercised only for '**one**' or '**some**' **series of bank notes** and not for '**all**' **series of bank notes**.
2. The power **can be exercised for all series of bank notes**. Merely because on two earlier occasions, **the demonetisation exercise** was by **plenary legislation**, it cannot be held that such a power **would not be available to the Central Government under sub-section (2) of Section 26 of the RBI Act**, the bench said.
3. The apex court said the **modern approach of interpretation** is a **pragmatic one**, and **not pedantic**.
4. **An interpretation** which advances the purpose of the Act and which ensures its smooth and harmonious working must be chosen and the other which leads to **absurdity**, or confusion, or friction, or contradiction and conflict between its various provisions, or undermines, or tends to defeat or destroy the **basic scheme and purpose of the enactment must be eschewed**.
5. The primary and foremost task of the Court in interpreting a statute is to gather the **intention of the legislature**, actual or imputed.
6. The top court said an interpretation which, in effect, **nullifies the purpose for which a power is to be exercised** would be opposed to the principle of purposive interpretation.
7. The **top court's judgment** came on a **batch of 58 petitions challenging the demonetisation exercise** announced by the Centre on 8 November 2016.

Why was demonetisation challenged?

1. The **petitioners contending that** the procedure prescribed in **Section 26(2) of RBI Act, 1934**, was not followed.
2. **Section 26(2) of the Act states** that "on recommendation of the [RBI] Central Board, the Central Government may, **by notification in the Gazette of India**, declare that, with effect from such date, any series of bank notes of any denomination **shall cease to be legal tender** save at such office or agency of the Bank and to such extent as may be specified in the notification.
3. It was argued that **as per the particular section**, the recommendation **should have emanated** from the RBI, but in this case, the **government had advised** the central bank, following which it made the recommendation.
4. It was said when **earlier governments had demonetised currency in 1946 and 1978**; they had done so by way of a law made by Parliament.

CENTRE LAUNCHES 'SMART' PROGRAM

National Commission for Indian System of Medicine (NCISM) and Central Council for Research in Ayurvedic Sciences (CCRAS) under ministry of Ayush on 2 January 2023 launched 'SMART'- scope for mainstreaming ayurveda research in teaching professionals programme.

More about the programme

1. The programme aims to **boost scientific research in healthcare research areas** through **ayurveda colleges and hospitals**, the Ministry of Ayush said.
2. The '**SMART**' program will have a **deep long term rejuvenating impact on research** in the **field of Ayurveda** and it will be a great service to the nation.
3. The **proposed initiative** is conceptualised with an **objective to identify, support and promote innovative research ideas in healthcare** research areas including **Osteoarthritis, Iron Deficiency Anaemia, Chronic Bronchitis, Dyslipidemia, Rheumatoid Arthritis, Obesity, Diabetes Mellitus**, Psoriasis, Generalised Anxiety Disorder, Non-alcoholic fatty liver disease (NAFLD).
4. The **eligible Ayurveda academic institutions** may apply by 10 January, 2023. All details regarding contact information, eligibility criteria and application process has been shared to all recognized academic institutions and hospitals through NCISM.
5. The **large network of Ayurveda colleges and hospitals across the country** is an asset for the country in terms of its **healthcare needs**.
6. This network has **not only been offering healthcare services in hardest times**, but it also has contributed significantly in terms of **healthcare research in the country**. The '**SMART**' program will **certainly motivate teachers** for taking up projects in designated areas of healthcare research and create a large database.

PRAVASI BHARATIYA DIWAS 2023 BEGINS

The **17th edition of the Pravasi Bharatiya Diwas (PBD)**, or the **day for Non-Resident Indians (NRIs)** that is commemorated annually on 9 January, was marked by the Central government with events in **Indore**, Madhya Pradesh. The programme began on 8 January 2023, when the **Youth Pravasi Bharatiya Divas** was held.

What is PBD?

1. **Pravasi Bharatiya Divas (PBD)** is an annual event **celebrated in India** to mark the contribution of the **overseas Indian community** to the development of India.
2. It is held on **9th January every year** to commemorate the **return of Mahatma Gandhi from South Africa in 1915**, and his role in India's Independence movement
3. The event was **first held in 2003**, and has been held annually since then. It is organised by the **Ministry of External Affairs of the Government of India**, in partnership with the **Confederation of Indian Industry and other organisations**.

What it offers

1. **PBD** provides a **platform for the overseas Indian community** to engage with the government and people of India, and to share their experiences and insights.
2. It also helps to **strengthen ties between India and the global Indian diaspora**, and to recognise the achievements and contributions of Indians living abroad.

Why PBD matters

1. **PBD** is an opportunity for the government to **showcase the progress and development of the country** to the global Indian community.
2. It is a way to showcase the achievements and potential of India as a nation, and to highlight the opportunities that are **available for Indians living abroad** to invest, work, and study in India.

What's Indian diaspora?

1. The **Indian diaspora** includes the **Non-Resident Indians (NRIs)** and the **Person of Indian Origin (PIO)**.
2. The **two communities** have played a major role in promoting and facilitating investments by expatriate Indians in India.

PBD and economy

1. **PBD** has contributed to **the growth of India's economy** by attracting **foreign investment** and **promoting the export of Indian goods and services**.
2. It has also helped to create jobs and **stimulate economic activity in India**, by encouraging the return of skilled Indian workers and entrepreneurs.
3. PBD has helped to **promote the transfer of knowledge, technology**, and expertise between India and the **global Indian diaspora**, which has contributed to the overall development of the Indian economy.

SC VERDICT ON RIGHT TO FREEDOM OF SPEECH

A statement made by a minister, **including MLAs and MPs**, cannot be attributed vicariously to the government even when applying the **principle of collective responsibility**, the Supreme Court said on 3 January 2023. A **five-judge Constitution bench**, headed by **Justice S A Nazeer** gave the decision. It said **no additional restrictions against free speech** can be imposed except those mentioned **under Article 19(2) of the Constitution**, which follows **Article 19**.

What does the judgment say about free speech restrictions?

1. An important question here was **“whether restrictions can be imposed on a public functionary’s right to freedom of speech and expression”**.

2. A statement made by a minister even **if traceable to any affairs of the state or for protection of the government** cannot be attributed vicariously to the government by invoking the **principle of collective responsibility**, the majority ruled.

3. Further, it said while citizens had **the right to petition the Court for violations of Article 19 (freedom of expression) and Article 21 (right to life)**, a statement made by the Minister, inconsistent with the rights of the citizens, may not by itself be actionable. But if it leads **to omission or commission of offence** by a public official, then remedies can be sought against it.

What was the case about?

1. The case, **Kaushal Kishor v the State of Uttar Pradesh**, relates to the **Bulandshahar rape incident of 2016**, in which the then Minister of the State of Uttar Pradesh and Samajwadi Party leader Azam Khan termed the incident a **‘political conspiracy and nothing else’**.
2. The **survivors then filed a writ petition before the Apex Court** seeking action against Khan.
3. While directing him to submit an **unconditional apology**, which he did, the Court also noted that the case raises serious concerns regarding **state obligation and freedom of speech and expression**. Several questions were framed on the matter.

ASI-PROTECTED MONUMENTS UNTRACEABLE

Fifty of India's 3,693 centrally protected monuments have gone missing, the **Ministry of Culture** has told Parliament. The submissions were made by the ministry on 8 December 2022 to the **Parliamentary Standing Committee on Transport, Tourism and Culture** as part of a report titled '**Issues relating to Untraceable Monuments and Protection of Monuments in India**'.

How can a monument go "missing"?

1. The **ASI was founded in 1861** by **Alexander Cunningham**, when he realised the need for a permanent body to oversee archaeological excavations and conservation.
2. But while the **body remained largely dysfunctional in the 19th century** owing to fund crunch, in the decades preceding Independence, it became very active.
3. **Bulks of the protected monuments were taken under the ASI's wings** during the 1920s and 30s, up till the 50s, officials told The Indian Express.
4. But in the **decades after independence**, the **focus of successive governments** was on **health, education and infrastructure**, rather than **protecting heritage**.
5. **Many monuments and sites** were lost to activities like **urbanisation, construction of dams and reservoirs, and even encroachments**.
6. As per the ASI submission in Parliament, **14 monuments have been lost to rapid urbanisation, 12 are submerged by reservoirs/dams, while 24 are untraceable**, which brings the number of **missing monuments to 50**.

What are centrally protected monuments?

1. The **Ancient Monuments and Archaeological Sites and Remains Act (AMASR Act)** regulates the preservation of **monuments and archaeological sites** of national importance.
2. The **Archaeological Survey of India (ASI)**, which is under the **aegis of the Union Ministry of Culture**, functions under this Act.
3. The Act protects monuments and sites that are **more than 100 years old**, including temples, cemeteries, inscriptions, tombs, forts, palaces, step-wells, rock-cut caves, and even objects like **cannons and mile pillars** that may be of historical significance.
4. According to the provisions of **AMASR Act**, ASI officials are supposed to regularly inspect the monuments to assess their condition.
5. Apart from **various conservation and preservation operations**, ASI officials can also file police complaints, issue show cause notices for the **removal of encroachments**, and communicate to the local administration the need for **demolition of encroachments**.

JOSHIMATH CRISIS CAUSED BY LAND SUBSIDENCE

After **cracks appeared in many roads and hundreds of houses of Joshimath**, Uttarakhand, authorities on 8 January 2023 declared it a **landslide and subsidence-hit zone**. The announcement came after a **high-level meeting** took place among the senior officials of the Central government, Uttarakhand state officials, and top officers from agencies including the **National Disaster Management Authority (NDMA)**, **Geological Survey of India (GSI)** and the **National Institute of Hydrology (NIH)**.

What can be the reasons behind Joshimath subsidence?

1. The exact reason behind **Joshimath land subsidence** is still unknown but experts suggest that the incident might have occurred because of **unplanned construction, over-population, obstruction of the natural flow of water and hydel power activities**.
2. Not only this, the area is a **seismic zone**, which makes it prone to frequent earthquakes.

3. The possibility of such an incident happening in the region was **first highlighted around 50 years** when the **MC Mishra committee report** was published and it cautioned against **“unplanned development in this area, and identified the natural vulnerabilities.”**
4. According to experts, **Joshimath city** has been built on an **ancient landslide material** — meaning it **rests on a deposit of sand and stone**, not rock, which doesn't have **high load-bearing capacity**.
5. This makes the area extremely vulnerable to **ever-burgeoning infrastructure** and population.
6. Moreover, **the lack of a proper drainage system** might have also contributed to the **sinking of the area**.
7. Experts say that **unplanned and unauthorised construction** has led to the **blocking of the natural flow of water**, which eventually results in frequent landslides.
8. Apart from the aforementioned possible reasons, reports have pointed out that subsidence in Joshimath might have been triggered by the **reactivation of a geographic fault** — defined as a **fracture or zone of fractures between two blocks of rock** — where the Indian Plate has pushed under the Eurasian Plate along the Himalayas.

What is land subsidence?

1. According to the **National Oceanic and Atmospheric Administration (NOAA)**, subsidence is the **“sinking of the ground because of underground material movement”**.
2. It can happen for a host of reasons, **man-made or natural**, such as the **removal of water, oil, or natural resources**, along with mining activities.
3. **Earthquakes, soil erosion, and soil compaction** are also some of the well-known causes of subsidence.
4. This phenomenon can **“happen over very large areas like whole states or provinces, or very small areas like the corner of your yard.”**

DELEGATED LEGISLATION IN SC VERDICT

In upholding the **Centre's 2016 decision on demonetisation**, one of the key questions to **decide for the Supreme Court** was **whether Parliament gave excessive powers** to the Centre **under the law to demonetise currency**. While the majority ruling upheld the **validity of the delegated legislation**, the dissenting verdict noted that **excessive delegation of power is arbitrary**. What is delegated legislation?

What is delegated legislation?

1. **Parliament** routinely **delegates certain functions** to authorities established by law since every aspect **cannot be dealt with directly by the law makers themselves**.
2. This **delegation of powers is noted in statutes**, which are commonly referred to as delegated legislations.
3. The **delegated legislation** would specify operational details, giving power to those executing the details.

What was the delegation of power in the demonetisation case?

1. **Section 26(2)** of the **Reserve Bank of India Act, 1934** essentially gives powers to the Centre to notify that a particular denomination of currency ceases to be legal tender.
2. The provision reads: “On recommendation of the Central Board the Central Government may, **by notification in the Gazette of India**, declare that, with effect from such date as may be specified in the notification, **any series of bank notes** of any denomination shall **cease to be legal tender**.”
3. Here, Parliament, which enacted the **RBI Act**, is essentially delegating the power to alter the **nature of legal tender to the central government**.
4. The Centre exercised that power by issuing a gazette notification, which is essentially the legislative basis for the demonetisation exercise.

4. **Regulations and by-laws under legislations** are classic examples of **delegated legislation**.
5. A **1973 Supreme Court ruling** explains the concept as: “**The practice of empowering the Executive** to make subordinate legislation within a prescribed sphere has evolved out of **practical necessity** and **pragmatic needs of a modern welfare State**.”
6. At the same time it has to be borne in mind that our Constitution-makers have entrusted the **power of legislation to the representatives of the people**, so that the said power may be exercised not only in the name of the people but also by the people speaking through their representatives.
7. The role against **excessive delegation of legislative authority** flows from and is a necessary postulate of the sovereignty of the people.”

INTERNATIONAL

INDIA, PAKISTAN EXCHANGE LIST OF NUCLEAR INSTALLATIONS

In continuing a **32-year practice**, **India and Pakistan** on 1 January 2023 **exchanged a list of their nuclear installations** under a **bilateral pact** which prohibits the two sides from attacking each other's **atomic facilities**. The exchange of the list took place under the **provisions of the agreement on the prohibition of attack against nuclear installations and facilities**.

What

1. It was done simultaneously through **diplomatic channels** in **New Delhi** and **Islamabad**.
2. **The agreement** was signed on **31 December 1988** and came into force on **27 January 1991**.
3. The pact mandates **India and Pakistan to inform each other of the nuclear installations and facilities** covered under the agreement on the **first of January of every calendar year**.
4. This is the **32nd consecutive exchange of such lists** between the two countries, the first one having taken place on 1 January 1992.
5. The exchange of the list came amid **continuing strain in ties between the two countries over the Kashmir issue** as well as cross-border terrorism.
6. **Pakistan** first **officially tested nuclear weapons in 1998** and has since developed a significant stockpile of nuclear capable missiles, as **has India**.
7. With the **help of China**, Pakistan has recently **increased its use of nuclear energy to meet the rising demand for electricity**.

‘TITLE 42’ IMMIGRATION POLICY

The **United States** announced on 5 January 2023 **it will extend COVID-19 pandemic-era restrictions**, known as **Title 42**, to **expel migrants from Nicaragua, Cuba and Haiti** caught crossing the **U.S.-Mexico border back to Mexico**, a move would block more nationalities from seeking asylum in the United States. At the same time, the White House said **it would open more legal pathways for migrants** from those nations to apply to enter the country from abroad.

Why are migrants blocked at the border under covid rules?

1. At the start of the COVID-19 pandemic in March 2020, U.S. health authorities issued **Title 42 to allow border agents to rapidly send migrants** crossing the U.S.-Mexico border back to Mexico or other countries.

2. The order was implemented under **Republican former President Donald Trump**, whose administration sought to greatly curtail both immigration.
3. The **U.S. Centers for Disease Control and Prevention (CDC)** said at the time it was needed to stem the spread of COVID-19 in crowded detention settings.
4. Some public health experts, Democrats and advocates have criticized and **pushed back against the order**, saying it unlawfully blocked migrants from **claiming asylum** and subjected them to dangers, like **kidnapping and assault**, in Mexico.
5. Migrants and immigrant advocate organizations sued seeking to lift the order, while Republican states have sued to keep it in place, litigation that is still ongoing.

How did Biden handle Title 42?

1. U.S. President Joe Biden, a Democrat who took office in **January 2021**, campaigned on a promise **to reverse Trump's restrictive asylum policies**.
2. While Biden moved to end some Trump restrictions, he left **Title 42** in place for more than a year, **exempting unaccompanied children** but allowing U.S. authorities to send hundreds of thousands of migrants, including families, back to Mexico.
3. Since Biden took office, there have been **record numbers of migrants** caught crossing the **U.S.-Mexico border**, causing operational and political challenges for his administration. Many have repeatedly crossed after being expelled under **Title 42** to nearby Mexican border cities.
4. **Mexico**, however, had **initially only accepted the return of some nationalities**, including its **own citizens and migrants** from Guatemala, Honduras and El Salvador.
5. In October, the expulsions were **expanded to Venezuelans**. Other nationalities have generally been let into the United States to pursue their immigration cases, **straining some border cities** where many migrants have recently arrived like El Paso, Texas.

ECONOMY

FIRST TIME RBI ISSUE GREEN BONDS

On 6 January 2023, the **Reserve Bank of India (RBI)** announced that it will, **for the first-time**, issue **Sovereign Green Bonds (SgrBs)** worth Rs 16,000 crore, in two tranches of Rs 8,000 crore each in the current financial year. The RBI said it will issue **5-year** and **10-year green bonds** of Rs 4,000 crore each on 25 January and 9 February 2023.

What are Green Bonds?

1. **Green bonds** are bonds issued by **any sovereign entity, inter-governmental groups or alliances** and corporates with the aim that the proceeds of the bonds are utilised for projects classified as **environmentally sustainable**.
2. The framework for the **sovereign green bond** was issued by the government on 9 November 2022.

Why are these bonds important?

1. Over the last few years, **Green Bonds** have emerged as an **important financial instrument** to deal with the **threats of climate change** and related challenges.
2. According to the **International Finance Corporation (IFC)**, a **World Bank Group's institution**, climate change threatens communities and economies, and it poses **risks for agriculture, food, and water supplies**.
3. A lot of financing is needed to address these challenges. It's critical **to connect environmental projects** with capital markets and investors and channel capital towards **sustainable development** – and **Green Bonds** are a way to make that connection.

How beneficial is it for investors?

1. **Green Bonds** offer investors a platform to **engage in good practices**, influencing the **business strategy** of bond issuers.
2. They provide a **means to hedge against climate change risks** while achieving at least similar, if not better, returns on their investment.
3. In this way, **the growth in Green Bonds** and **green finance** also indirectly works to disincentivise **high carbon-emitting projects**, as per the IFC.

Where will the proceeds go?

1. The government will use the proceeds raised from SGrBs to **finance or refinance expenditure** (in parts or whole) for **various green projects**, including in **renewable energy, clean transportation, energy efficiency, climate change adaptation**, sustainable water and waste management, pollution and prevention control and green buildings.
2. **In renewable energy**, investments will be made in **solar, wind, biomass and hydropower energy projects**.

COUNTRY'S FIRST FULLY DIGITAL BANKING STATE

Chief Minister Pinarayi Vijayan on 7 January 2023 declared **Kerala as the first state in the country** to go **fully digital** in its **banking service** and said this recognition would boost the state economy. This achievement was possible due to **social interventions through local self-government institutions** along with infrastructure development and technological advances in the banking sector.

What

1. The Chief Minister also said the ambitious **Kerala Fibre Optic Network (K-FON) project** of the state government, which was almost 90 per cent completed, **will reduce the digital divide**.
2. The **K-FON** will ensure **internet facility to everyone** in the state and **17,155 km-long optic fibre cable network** has been laid.
3. Once the project gets completed, **internet will be available to everyone** in the state either for a cheaper price or for free-of-cost.
4. **Technological advances** also underscored the **need to be vigilant** against **cybercrimes** in the banking sector.
5. The government had created the **Economic Offences Wing** in the State police to tackle such offences. But preventing them **through public awareness and cooperation of the banking sector** was paramount.
6. The government had undertaken, through **local bodies**, a programme to **raise digital literacy**.
7. That Kerala had won **three awards** at the recent **Digital India Awards** instituted by the **Department of Electronics and Information Technology, Government of India**, showed the State's commitment to implementing efficient digital mechanisms.

SCIENCE AND TECHNOLOGY

SECOND SATELLITE TO MONITOR SPACE WEATHER

Space sector start-up **Digantara** launched its **second satellite Pushan-Alpha** as a rideshare onboard **SpaceX's Transporter-6 mission** that soared to the **low earth orbit** from Cape Canaveral in Florida, US. The satellite will serve as a **space weather testbed** in the **sun synchronous orbit** for enhancing precision driven **situational space awareness applications**.

More about the Satellite

1. The **Pushan-Alpha observations** will help complement **Digantara's ROBI (ROBust Integrating proton fluence meter) mission**, the **world's first commercial space-based space weather monitoring system** onboard **ISRO's PSLV-C53** launched on 30 June last year.
2. The **Pushan-Alpha mission** is named after the Hindu solar deity considered as the **god of journeys and protector of travellers**.
3. The **Pushan-Alpha mission** has a three-fold objective -- **to extend radiation measurements** to the sun synchronous orbit; **to assess mid to high energy particle radiation** from the South Atlantic Anomaly; and **to investigate any co-relation of atmospheric drag** and particle environment for enhanced orbit and debris modelling.
4. Bengaluru-based **Digantara** is developing **end-to-end infrastructure** to address the difficulties of space operations and **space traffic management** through its **Space Mission Assurance Platform**.
5. **Transporter-6** was **SpaceX's sixth dedicated smallest rideshare mission** carrying 114 payloads, including **orbital transfer vehicles** carrying spacecraft to be deployed at a later time.

DRDO SCIENTISTS DEVELOP 'RAT CYBORGS'

Indian defence scientists have created the first batch of “**rat cyborgs**” in their laboratory with the **ultimate aim of providing a live video feed to security forces** from inside a building in case of a **26/11-type scenario**, in which the enemy has taken over a premise, but troops are bereft of a sitrep.

What

1. Developed by a bunch of young researchers from Hyderabad, **rat cyborgs** are nothing but **standard laboratory rodents**, in whose brains the scientists have installed an **electrode** that can receive signals from outside. A **tiny camera** would be strapped in its back for capturing live images.
2. Once released inside a building, the **rat cyborgs**, armed with such tools, can go anywhere in an **inconspicuous manner**, climb a wall and hide from the enemy using **their natural ability to camouflage**.
3. Scientists are in the process of perfecting the way in which **rodents can be manoeuvred using external signals**.
4. Our objective is **intelligence gathering** by manoeuvring the rats with electronic commands through **semi-invasive brain electrodes**, P Shiva Prasad, director of DRDO Young Scientist Laboratory (DYSL) in Hyderabad said while making a presentation on **asymmetric technologies** at the **108th session of the Indian Science Congress**.
5. This is one of the **emerging strategic technologies** which DYSL has decided to pursue as an alternative to more **conspicuous robots** that have limitations in terms of mobility. **The rodents offer a more flexible option**.

Flashback

1. The **rat-cyborg technology** was proposed by a **group of Chinese scientists in 2019** using the **brain-machine interface technology** that seeks to control a **rodent's brain** by an external stimulus.
2. The **Chinese team used six such rats** for an experiment in which the creatures were commanded to take turns – first simple ones and subsequently more complex ones with tight turns, multiple levels and a specific prescribed path.
3. Overall the **rat cyborgs handled the experiment well** with improved control over time and two of the rats performed flawlessly, as per the Chinese study that was published in a reputed peer-reviewed journal.

THE VSHORAD MISSILE SYSTEM

The **Defence Acquisition Council (DAC)** on 10 January 2023 accorded **Acceptance of Necessity (AoN)** to procure the **Very Short Range Air Defence System** or **VSHORAD (IR Homing) missile system**, designed and developed by the Defence Research and Development Organisation (DRDO). The development comes amid the **ongoing military standoff with China at the LAC** in **eastern Ladakh** and reports of **air violations by China** along the LAC last year.

What is the missile system?

1. Meant to **kill low altitude aerial threats at short ranges**, VSHORADS is a **man portable Air Defence System (MANPAD)** designed and developed indigenously by **DRDO's Research Centre Imarat (RCI)**, Hyderabad, in collaboration with other DRDO laboratories and Indian Industry Partners.
2. The DRDO, in September last year, conducted **two successful test flights** of the **VSHORADS missile** from a ground based portable launcher at the Integrated Test Range, Chandipur, off the coast of Odisha.
3. As per the defence ministry, the missile—**which is propelled by a dual thrust solid motor**—incorporates many novel technologies including **miniaturised Reaction Control System (RCS)** and integrated avionics, which were successfully proven during the tests conducted last year. The **DRDO has designed the missile** and its launcher in a way to ensure easy portability.

How will it help India?

1. While **the exact specifications of the missile are not immediately known**, officers in the Army explained that being **man portable and lightweight** compared to the other missile systems in the Army's armoury, it can be deployed in the mountains close to the LAC at a **short notice**.
2. When it comes to **man portable air defence missiles**, there was a **critical gap** in the Army's inventory, especially for the **eastern and northern borders**, though not so much for the **western borders with Pakistan**, for which India has the **Soviet-vintage OSA AK missile systems**.
3. Others like the **Akash Short Range Surface to Air Missile System** are heavier with a **theatre air defence umbrella of up to 25 km** and can be deployed further away from the LAC for static formations.
4. When inducted, **they will be a critical air defence missile for the forces**, even for an **all-equipped infantry unit**, and will be the best option for mountain warfare.

PSINSAR SATELLITE TECHNIQUE

The **PSInSAR satellite technique** used to **observe the gradual sinking of Uttarakhand's Joshimath town** is a **powerful remote sensing tool** capable of measuring and monitoring displacements in the Earth's surface over time. The **Indian Institute of Technology (IIT) Ropar** in Punjab said that its researchers had in **2021 predicted a large-scale subsidence in Joshimath**.

More about the technique

1. The researchers collected **remote sensing data** using the **Persistent Scatterer Synthetic Aperture Radar (PSInSAR)** Interferometry technique to observe the sinking.
2. A **Synthetic Aperture Radar (SAR)** is a **form of radar** that is used to **create two-dimensional images** or **three-dimensional reconstructions of objects**, such as landscapes.
3. A **signal from an SAR satellite** interacts with **different targets** and goes back to the **sensor located in the satellite**, based on which an image is created. In our study, **Sentinel 1 SAR satellite data** was used," said IIT-Ropar.

4. So, **for active SAR sensors**, the built-up structures such as buildings act as **persistent or permanent scatterers**.
5. **Scattering** refers to a **change in the direction of light** because of its **collision or interaction** with another particle, say buildings.
6. The buildings are "**scatterers**", and because **they are usually static and do not record movements**, they are referred to as "**permanent scatterers**" or "**persistent scatterers**".
7. In **PSInSAR**, the **persistent scatterers in question are imaged over a period of time** at regular intervals. Therefore, successive images are acquired.
8. **Any change in the signal** received after **having been scattered by the target** is due to change in the target movement.
9. Since **persistent scatterers** are not usually expected to move, therefore, any movement, even **on a scale of millimetres**, arising from **crustal deformations** or **seismic activity** or **even structural failure** is captured precisely.

What is land subsidence and how does it differ from a landslide?

1. **Land subsidence** is when the **normal ground itself starts sinking** or gets displaced all together.
2. On the other hand, **landslides occur when a mass of rock** located at **higher elevation falls down on a lower surface** or road either due to **slip action** or **under influence of gravity**.
3. While **landslides are a highly localised phenomenon**, **land subsidence usually covers a larger area**.
4. **Land subsidence is the slow settling of ground over a large area**, which can happen in plains as well.
5. However, in a **landslide**, a **mountain slope fails** due to **different reasons**, one of them being heavy rainfall.

DOPPLER WEATHER RADARS

On 15 January 2023, **Jammu and Kashmir Lt Governor Manoj Sinha** and Union Science Technology and Earth Sciences **Minister Dr Jitendra Singh** jointly inaugurated the **X-Band Doppler Weather Radar** at Banihal Top during the **148th Foundation Day** celebrations of **India Meteorological Department**.

What is Radar?

1. **RADAR** is the expansion for **Radio, Detection and Ranging**. Its basic components are a **transmitter, receiver, antenna, power supply system, signal processing** and high computing devices.
2. It works on **the principle of electromagnetic waves** sent out by the **transmitter**. The same wave that **strikes an object/dense medium** is **reflected back to the receiver**.
3. The distance up to the object is determined based on the **speed of the electromagnetic wave**, and the time **to travel to the object and back**.
4. There are at least **ten types of Radars**. The **Ground Penetrating Radar** studies the **Earth's crust up to 9-metre in depth** and is being used by the **Defence Geoinformatics Research Establishment (DGRE)** at Joshimath.
5. The **InSAR (Interferometric Synthetic Aperture Radar)** that makes **high-density measurements** over large areas by using radar signals from **Earth-orbiting satellites** and measures changes in **land-surface** is also being used in Joshimath and other parts of Uttarakhand.

What is a Doppler radar?

1. A **Doppler Radar** is a **specialised radar** that **uses the Doppler effect** to produce **velocity data** about **objects at a distance**.
2. When the source and the signal are in relative motion to each other, there is a **change in the frequency** observed by the observer. This is called the **Doppler Effect**. If they are moving closer, the frequency increases and vice versa.
3. A **Doppler Weather Radar (DWR)** works on the Doppler principle. It is designed to improve precision in **long-range weather forecasting and surveillance** using a **parabolic dish antenna** and a foam **sandwich spherical radome**.
4. **DWR** has the equipment **to measure rainfall intensity, wind shear** and velocity and locate a storm centre and the direction of a tornado or gust front.

MISCELLANEOUS

PM INAUGURATE ISC VIRTUALLY

The **108th edition** of the **Indian Science Congress** inaugurated by Prime Minister through video conferencing which is meeting in Nagpur on 3 January 2023 after a two-year hiatus due to the Covid pandemic. The **previous edition of the Indian Science Congress**, a key event in the science calendar, was held in **Bengaluru in January 2020**.

More about the Indian Science Congress

1. The **five-day 108th session of ISC** take place at **Rashtrasant Tukadoji Maharaj Nagpur University**, which is celebrating its centenary this year.
2. This is perhaps the **first time in nearly two decades** that the prime minister was not **physically present at the gathering** of top scientists from across the spectrum, apparently due to his packed schedule.
3. The **focal theme of this year's Science Congress** is "**Science and Technology for Sustainable Development with Women Empowerment**."
4. The **annual Congress** will see discussions on issues of **sustainable development, women empowerment**, and the **role of science and technology** in achieving these objectives.
5. A **special programme** to showcase the **contribution of women in science and technology** will also be held with lectures by **renowned women scientists**.
6. The event will also see a **Children's Science Congress**, organised to help **stimulate scientific interest and temperament among children**.
7. The **Farmers' Science Congress** will provide a platform to improve the **bio-economy** and attract **young people to agriculture**.
8. The **Tribal Science Congress** will be a platform for the **scientific display of indigenous ancient knowledge systems** and practices and will focus on the **empowerment of tribal women**.

'UNPRECEDENTED' WINTER HEAT WAVE

Several parts of Europe witnessed an **unprecedented winter heat wave** over **New Year's weekend**; the continent is experiencing an **extreme warm spell** because of the **formation of a heat dome over the region**.

What is a heat dome?

1. A **heat dome** occurs when **an area of high-pressure traps warm air over a region**, just like a **lid on a pot**, for an extended period of time.

2. The longer that air remains trapped, **the more the sun works to heat the air**, producing **warmer conditions** with every passing day.
3. **Heat domes generally stay for a few days** but sometimes they can extend up to weeks, which might cause **deadly heat waves**.
4. Scientists suggest that **any region of high pressure**, whether a heat dome or not, **forces air to sink and once it reaches the ground**, it gets compressed and becomes even warmer.
5. Moreover, when air sinks, it gets drier and further **raises the temperature of the area**.

What is the relationship between heat domes and the jet stream?

1. The **heat dome's formation** is related to the **behaviour of the jet stream** — an area of **fast-moving air high in the atmosphere**.
2. The **jet stream is believed to have a wave-like pattern** that keeps moving from **north to south** and then north again.
3. **When these waves get bigger and elongated**, they move slowly and sometimes can become stationary. This is when a **high-pressure system gets stuck** and **leads to the occurrence of a heat dome**.
4. Although **heat domes** are likely to have always existed, researchers say that **climate change may be making them more intense and longer**.
5. They suggest with the rising temperatures, it is expected that the **jet stream will become wavier** and will have larger deviations, causing more frequent extreme heat events.

VILLAGE DEFENCE COMMITTEES REVIVED

After militants **killed six people** in two days in the **Upper Dangri village of Jammu and Kashmir** on 1 and 2 January 2023, **locals have demanded** that they be provided **weapons to take on attackers**. Responding to the demands, **Lt Governor Manoj Sinha** on 2 January 2023 assured the people that they would get a **Village Defence Committee (VDC)** on the lines of those in **Doda district**.

What is a VDC?

1. The **VDCs were first formed** in the **erstwhile Doda district** (now Kishtwar, Doda and Ramban districts) in **mid 1990s** as a force multiplier against militant attacks.
2. The then **Jammu and Kashmir administration** decided to provide **residents of remote hilly villages** with weapons and give them arms training to **defend themselves**.
3. The **VDCs have now been renamed as Village Defence Guards (VDG)**. The new scheme to **set up VDGs in vulnerable areas of J&K** was approved by the Union Ministry of Home Affairs in March last year.
4. Like a VDC member, **each VDG will be provided a gun and 100 rounds of ammunition**.

How are VDGs different from VDCs?

1. **Both VDG and VDC** is a **group of civilians** provided **guns and ammunition** to tackle militants **in case of attack until the arrival of security forces**.
2. Under the new scheme, **the persons leading the VDGs will be paid Rs 4,500 per month** by the government, **while others will get Rs 4,000 each**.
3. In the VDCs, only the **Special Police Officers (SPOs)** leading them were provided a remuneration, of **Rs 1,500 monthly**. The SPOs, the lowest rank in the J&K Police, used to be retired army, para military or police personnel.
4. The VDGs will function under the **direction of the SP/SSP of the district concerned**.

CENTRE DECLARES TRF TERRORIST ORGANISATION

Three months after **The Resistance Front (TRF)**, a **shadow organisation** of **Lashkar-e-Taiba (LeT)**, issued threats to journalists in Kashmir, the **Ministry of Home Affairs** on 5 December 2023 declared it a “**terrorist organisation**” under the **Unlawful Activities (Prevention) Act** for propaganda on **terror activities, recruitment of terrorists, infiltration of terrorists** and **smuggling of weapons** and narcotics from Pakistan into J&K.

According to a notification

1. According to a notification issued by the MHA, **TRF came into existence in 2019** as a **proxy outfit of LeT**, a proscribed terrorist organisation.
2. **TRF is recruiting youth through online medium** for furtherance of terrorist activities and has been also involved in carrying out propaganda on terror activities, recruitment of terrorists, **infiltration of terrorists and smuggling of weapons and narcotics from Pakistan into J&K**.
3. **TRF** is involved in **psychological operations on social media platforms** for inciting people of J&K **to join terrorist outfits** against the **Indian state**.
4. According to the MHA notification, **Sheikh Sajjad Gul**, a **TRF commander**, has been designated as a **terrorist** under the **Fourth Schedule of the UAPA**.
5. The activities of the TRF are **detrimental for the security and sovereignty of India**. A large number of cases have been registered against the members/associates of the TRF relating to **planning of killing of security personnel and civilians of J&K**, co-ordinating and transporting weapons to support proscribed terrorist organisations.
6. The group had issued threats to a few media houses in the Valley for their “**traitorous acts**” following which several journalists had resigned from local publications.
7. The **first signs of TRF emerging as a strong militant group** were visible when the J&K Police busted a module of overground workers in Sopore – the town was a strong Lashkar base in the Valley before it yielded its position to Hizbul Mujahideen and Jaish-e-Mohammad – and Kupwara.

WORLD HINDI DAY CELEBRATED

World Hindi Day, also known as **Vishwa Hindi Diwas**, is celebrated on 10 January every year by Hindi enthusiasts across the world **to mark the importance** and celebrate **Hindi as a language**.

Why Hindi Diwas celebrated

1. **Vishwa Hindi Diwas** was started to mark the anniversary of the **first time Hindi was spoken in the United Nations General Assembly (UNGA) in 1949**.
2. In the year **1975**, the then Prime Minister Indira Gandhi inaugurated the **first World Hindi Conference**. Since then, conferences have been organised in different parts of the world.
3. However, it was on **10 January 2006** when the **World Hindi Day was celebrated for the first time**.
4. This decision was announced by the then Prime Minister of India, Manmohan Singh.

Significance

1. The purpose of this day is **to create awareness about the Indian language and promote it as a global language around the world**.
2. It is also used **to create awareness** about the usage of the Indian language, and about the issues persisting around the usage and promotion of the Hindi language.

How to celebrate?

1. The Indian **Ministry of External Affairs** celebrates this day every year (since 2006) by organising events and activities around the usage and promotion of Hindi.
2. Sometimes, the day is also celebrated by the **Indian Postal Department** by issuing special stamps to mark the occasion.
3. Schools and students can celebrate this day by organising debate, discussions, Hindi poetry recitals, literature classes, plays, quizzes, and more in their schools or even localities. Several organisations, including Hindi clubs, can also hold debates and discussions.

World Hindi Day vs Hindi Diwas

1. While the **World Hindi Day** is celebrated on 10 January every year, **Hindi Diwas** is celebrated on 14 September annually.
2. This day concentrates on promotion and global recognition of the Hindi Language around the world.
3. On the other hand, **Hindi Diwas**, which is celebrated in India, focuses on **recognition of the Hindi language in India**.
4. However, there have been debates about promoting this language in **non-Hindi speaking regions**.

TROPICAL FORESTS CAN EMIT CARBON

A new study has found that **tropical forests**, which have been **logged (cut down)** or degraded, **remain a source of carbon emission for at least a decade**. The findings are contrary to a previous assumption – that **recovering tropical forests absorb more carbon than they emit** into the atmosphere because they witness rapid re-growth of trees.

More about the study

1. The study compared data collected from **both intact and logged forests** and concluded that the latter release a **substantial amount of carbon** from its damaged soil and decaying deadwood.
2. Researchers **Maria B. Mills (University of Leicester)**, **Terhi Riutta (University of Oxford)**, **Yadvinder Malhi**, (University of Oxford) and others from the **UK, Malaysia, Peru** and **Australia** authored the latest study, **'Tropical forests post-logging are a persistent net carbon source to the atmosphere'**, published in Proceedings of the National Academy of Sciences.
3. Our data **directly contradict the default assumption** that recovering logged and degraded tropical forests are **net carbon sinks**, implying the amount of carbon being sequestered across the **world's tropical forests** may be considerably lower than currently estimated," the researchers wrote in the paper.

What is carbon sequestration?

1. **Carbon sequestration** is a **crucial part of the global carbon cycle**, as it is the process of **capturing and storing atmospheric carbon dioxide**.
2. One of the ways this happens is when forests and **other land vegetation absorb carbon dioxide** during **photosynthesis**.
3. According to a 2014 NASA-led study, **tropical forests remove up to 30 per cent of human carbon dioxide emissions** from the atmosphere and make for an important **carbon sink** — an area which **absorbs more carbon than releases it**. Therefore, they have a significant role in keeping global temperatures low.

What makes this study's findings different?

1. Many of the previous studies on **recovering tropical forests** estimated the amount of carbon being absorbed by them by **only focusing on the regrowing of the trees**.
2. This means they are **only measuring the sink function of the forest**. If you imagine your bank account – it would be like only looking at your incomings, not your outgoings.

3. Their study was conducted in the **forests of Malaysian Borneo**, which is a **hotspot of deforestation and forest degradation**.
4. The region has a vast expanse of logged forests as well as old-growth protected forests, providing “**a great logging gradient to study**.”
5. To estimate the **carbon of the area**, the researchers used a **handheld infrared gas analyser monitor** to test patches of ground and pieces of deadwood. They also set up a **52 metres-high tower**, which measured the ‘**flux**’ of carbon into and out of the forest.

FACT TO REMEMBER:

1. **CENTRE EMPOWERED TO DEMONETISE: SC**
2. **CENTRE LAUNCHES ‘SMART’ PROGRAM**
3. **PRAVASI BHARATIYA DIWAS 2023 BEGINS**
4. **ASI-PROTECTED MONUMENTS UNTRACEABLE**
5. **JOSHIMATH CRISIS CAUSED BY LAND SUBSIDENCE**
6. **DELEGATED LEGISLATION IN SC VERDICT**
7. **‘TITLE 42’ IMMIGRATION POLICY**
8. **FIRST TIME RBI ISSUE GREEN BONDS**
9. **THE VSHORAD MISSILE SYSTEM**
10. **WORLD HINDI DAY CELEBRATED**

LINK TO FOLLOW

[HTTPS://THEPRINT.IN/OPINION/CEPEC-MADE-GWADAR-LOOK-ATTRACTIVE-TO-PAKISTAN-BUT-DEVELOPMENT-RINGING-HOLLOW-TO-LOCAL-PEOPLE/1307189/](https://theprint.in/opinion/cepec-made-gwadar-look-attractive-to-pakistan-but-development-ringing-hollow-to-local-people/1307189/)

[HTTPS://WWW.LIVEMINT.COM/OPINION/COLUMNS/WORKINGAGE-POPULATION-ON-THE-DECLINE-11672591629486.HTML](https://www.livemint.com/opinion/columns/workingage-population-on-the-decline-11672591629486.html)

[HTTPS://WWW.FREEPRESSJOURNAL.IN/ANALYSIS/THE-CONSEQUENCES-OF-A-DELAYED-CENSUS](https://www.freepressjournal.in/analysis/the-consequences-of-a-delayed-census)

[HTTPS://WWW.DECCANHERALD.COM/OPINION/MAIN-ARTICLE/ARE-RVMS-THE-BEST-WAY-1180501.HTML](https://www.deccanherald.com/opinion/main-article/are-rvms-the-best-way-1180501.html)

[HTTPS://WWW.ALJAZEERA.COM/OPINIONS/2023/1/11/SUDAN-SHOULD-NOT-SETTLE-FOR-ANYTHING-OTHER-THAN-TRUE-DEMOCRACY](https://www.aljazeera.com/opinions/2023/1/11/sudan-should-not-settle-for-anything-other-than-true-democracy)

PREVIOUS YEAR QUESTION 2022

Q. Among the following crops, which one is the most important anthropogenic source of both methane and nitrous oxide?

- (a) Cotton
- (b) Rice
- (c) Sugarcane
- (d) Wheat

Source: My Notes, August 1-15, 2022 page no. 10-11