Artesian Well in Rajasthan and Tethys Sea

Source: IE

Why in News?

Recently, large amounts of **water** began **gushing out** from underground in **Jaisalmer, Rajasthan** that is attributed to the **Artesian Well** in India.

- Experts **rejected** the idea of the water being **linked** to the ancient **Saraswati river,** suggesting water may be **millions of years old**, with origins from **Tethys sea** (pre-Vedic times).

What is an Artesian Well?

- **About:** An artesian well is a type of well in which **water rises naturally to the surface** under pressure without the need for pumping. This occurs when **water is trapped** in a **confined aquifer** and is under significant pressure.
  - It is also described as "confined" water because of **hardy materials above and below it.**
- **Formation**: Artesian wells are formed when a **well penetrates a confined aquifer**, which is a layer of **permeable rock** **or sediment** sandwiched between impermeable layers like clay or rock.
- **Pressure Mechanism**: The water in the confined aquifer is **under pressure** due to the **weight of the water above** it, and when the well is drilled, the pressure forces the water to rise through the **borehole**.
- **Water Flow**: In an artesian well, the water may **flow freely to the surface** if the pressure is sufficient, which is known as **"flowing artesian wells."**
  - If the p**ressure is not enough** to force the water to the surface, it can be **extracted using a pump.**
- **Locations**: Famous artesian wells are found in regions such as the **Great Artesian Basin in Australia**, **Dakota aquifer** in the United States, and **Africa.**
- **Difference with Tube Wells:** Artesian water can **naturally rise to the surface** on its own and is **found deeper** beneath the earth's surface whereas **tube wells require external power** to pump water.

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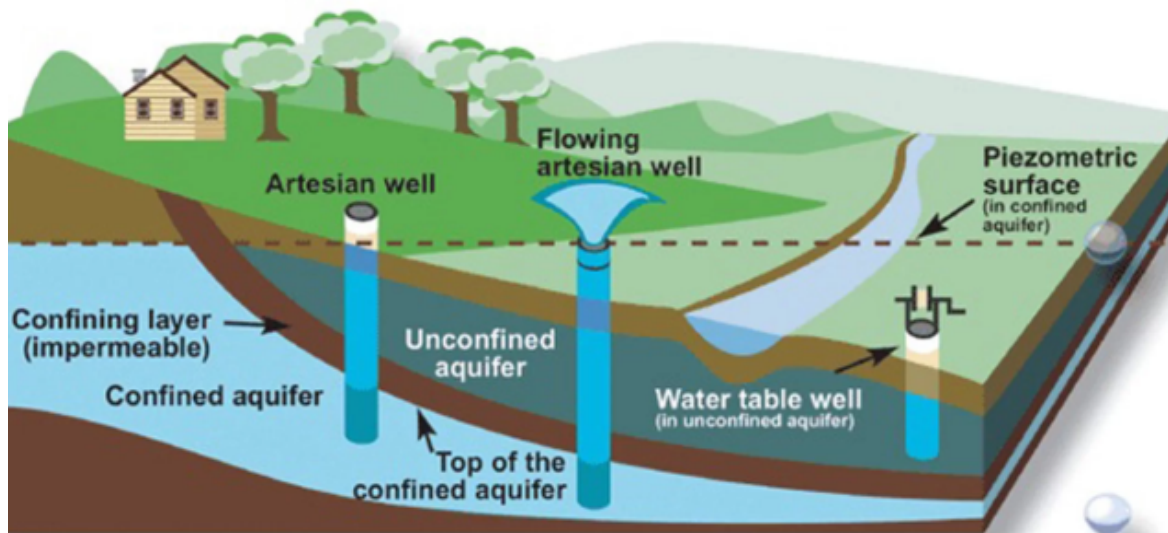
Note: The name **Artesian** comes from the town of **Artois in France, the old Roman city of Artesium,** where the best known flowing **artesian wells** were drilled in the **Middle Ages.**

What are the features of Artesian Well Found in Rajasthan?

- **Water Eruption:** In desert regions of Rajasthan, water is **confined underneath** a geological layer of **sandstone**.
  - As soon as the top layer is **punctured**, water starts flowing upwards due to heavy pressure, often gushing out like a **fountain.**
- **Ancient Sea Evidence**: The water found in the borewell exhibited **high salinity** that is similar to that from **ancient sea or saline groundwater sources.**
  - The water is believed to be linked to the **Tethys Sea**, which existed **around 250 million years ago.**
- **Presence of Marine Clay**: Along with the water, **Oozes (fine white marine clay having skeletal remains)** surfaced, further supporting the idea that the groundwater is remnants of an **ancient sea.**
  - The sand found in the area, believed to be from the **Tertiary period (around 6 million years ago),** was also brought up with the groundwater.
- **Geological Significance**: The Jaisalmer region once **bordered the Tethys Sea**, with **dinosaurs** inhabiting one side and deep waters on the other.
  - **Giant shark fossils** have been found only in India (Jaisalmer), Japan, and Thailand in Asia.

What are the Key Facts About the Tethys Sea?

- **About:** The Tethys Sea formed during the early stages of the **Mesozoic Era**, particularly during the **Triassic period** (about 250 to 201 million years ago).
  - It was located between the landmasses of **Gondwana** (the southern supercontinent) and **Laurasia** (the northern supercontinent).
    - Gondwanaland incorporated present-day **South America, Africa, Arabia, Madagascar, India, Australia, and Antarctica.**
    - Laurasia included **North America, Europe, and Asia (except peninsular India).**
- **Geographic Extent**: The Tethys Sea extended across what is now parts of **Europe, Asia, Africa, and the Middle East** and connected the **Pacific Ocean** in the east and the **Atlantic Ocean** in the west.
- **Closure:** By the **Late Cretaceous** (around 66 million years ago), the Tethys Sea began to close

as the **tectonic plates** continued to shift.

- The remnants of the Tethys Sea can still be seen today in the form of smaller seas, like the **Mediterranean Sea**, **Caspian Sea**, and **Black Sea**.
- **Tectonic Significance**: The gradual closure led to the creation of new landmasses, such as the **Indian subcontinent** moving toward the **Asian plate**, leading to the uplift of the **Himalayan mountain range** and the **Tibetan Plateau**.
- **Fossil Evidence**: The Tethys Sea is known for being home to a rich diversity of marine life, including early forms of **sharks, ammonites**, and **marine reptiles** like **ichthyosaurs** and **mosasaurs**.
  - The Tethys Sea's evolution helped form **petroleum basins** in North Africa and the Middle East, aiding **organic material accumulation and hydrocarbon maturation.**

~95 Million years ago

What are Other Examples of Underwater Gushing on the Surface?

- **Hydrothermal Vents:** They are **underwater hot springs** found near the **tectonic plates,** where hot **water and minerals** from beneath the Earth's crust are expelled into the **ocean.**
- **Hot springs:** Hot springs on land are areas where **heated groundwater** (heated by geothermal heat from Earth's interior) emerges at the surface.
  - E.g., **Manikaran** (Himachal Pradesh), **Gaurikund** (Uttarakhand).
- **Geysers:** These are geothermal features that **periodically eject water and steam** due to underground heating.
  - When heated by **nearby magma**, the water flashes into steam, causing an eruption of hot water and steam. E.g., **Yellowstone National Park (US).**
- **Mudpots:** These are the **bubbling pools of mud** that form in geothermal areas. They are formed when limited **geothermal water mixes with mud and clay.**
- **Fumaroles:** Fumaroles occur when **magma passes through the water table,** heating the water and causing steam to rise, carrying volcanic gases like **hydrogen sulfide (H2S)** to the surface.
  - It is often found near **"dying volcanoes"** where magma deep underground has solidified and cooled. E.g., **Barren Island** (Andaman and Nicobar Islands)
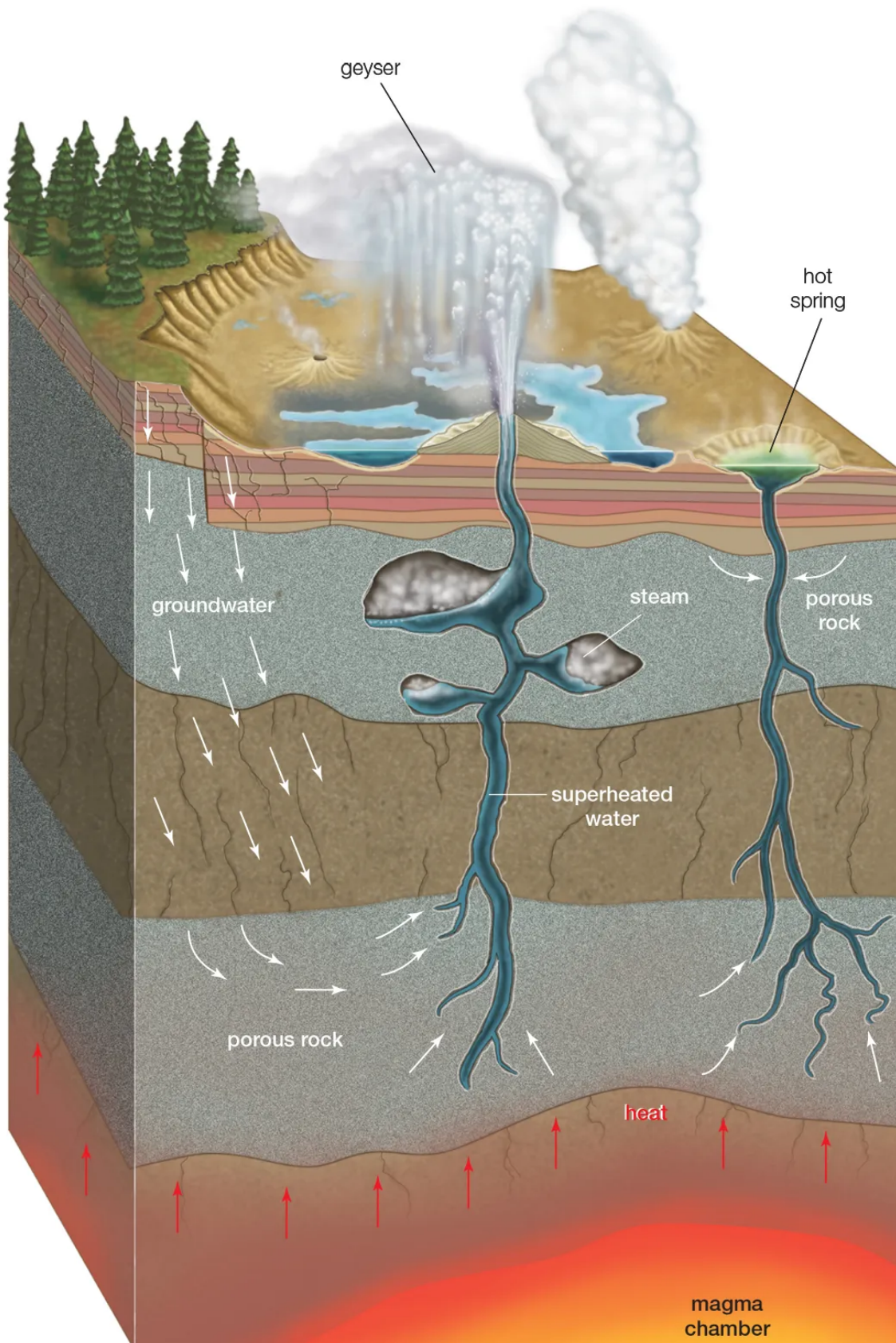
Saraswati River

- **About**: It is a river mentioned in ancient Indian texts, primarily the **Vedas** in which the Saraswati river is considered the **holiest and mightiest** river of the **Vedic Period** [(8000-5000 years before present (BP)].

- **Origin and Course**: It originated in the **Himalayas** and flowed through the regions of **Punjab**, **Haryana**, **Western Rajasthan**, and **Gujarat** between the **Indus river** in the west and the **Ganges river** in the east.
    - The river eventually drains into the **Gulf of Kachchh** in the **Arabian Sea**.
- **Disappearance**: The Saraswati river **disappeared around 5000 BP** due to **climatic** and **tectonic changes**.
    - It is believed that the river still flows underground beneath the **Thar Desert** and retains its **Himalayan connectivity**.
- **Mention in Ancient Literature**: The **Saraswati River** is mentioned frequently in ancient texts like the **Vedas**, **Manusmriti**, **Mahabharata**, and **Puranas**.
    - **Vedas**: The Saraswati is called the **"Best of Mothers," "Rivers," and "Goddesses,"** with the Rigveda highlighting its importance and the **Yajurveda** mentioning its **tributaries.**
    - **Manusmriti**: The area between the **Saraswati and Drishadvati river** (seasonal river in Haryana) is regarded as **Brahmavarta**, created by God.
    - **Mahabharata**: Mentions **pilgrimage sites** along the river and its disappearance into desert sand at **Vinasana** (place where the Saraswati river disappeared) due to low water discharge.
    - **Puranas**: The **Markandeya Purana** describes the Saraswati rising from the **Plaksha tree (Pipal tree)** with a sage worshipping its rise.

Conclusion

The recent gushing of water from underground in **Jaisalmer, Rajasthan**, attributed to an artesian well, has sparked debates about its connection to the **ancient Saraswati River**. However, scientific analysis suggests that the water is from **ancient sea remnants,** specifically linked to the **Tethys Sea, rather than the Saraswati River.**

> ***Drishti Mains Question:***
>
> Discuss the concept and formation of artesian wells.

Q. Salinization occurs when the irrigation water accumulated in the soil evaporates, leaving behind salts and minerals. What are the effects of salinization on the irrigated land? (2011)

(a) It greatly increases the crop production

(b) It makes some soils impermeable

(c) It raises the water table

(d) It fills the air spaces in the soil with water

Ans: (b)

Global Nutrition Targets

Source: TH

Why in News?

A recent *Lancet* study evaluating **global progress on Global Nutrition Targets (GNTs) from 2012 to 2021** showed **slow progress** in tackling maternal and **child malnutrition,** undernutrition, and **overweight**.

- The findings raise concerns about policy design and the need for innovative strategies to address these ongoing issues.

What are Global Nutrition Targets (GNTs)?

- **World Health Assembly Resolution, 2012:** Endorsed a Comprehensive Implementation Plan on **maternal, infant, and young child nutrition,** setting six global nutrition targets for 2025.
- **Global Nutrition Targets:**
  - Achieve a **40% reduction in the number of children under-5** who are stunted.
  - Achieve a **50% reduction in anaemia** in women of reproductive age.
  - Achieve a **30% reduction in low birth weight.**
  - Ensure that there is **no increase in childhood overweight.**
  - Increase the **rate of exclusive breastfeeding in the first 6 months to at least 50%.**
  - Reduce and **maintain childhood wasting to less than 5%.**

Key Terms

- **Malnutrition:** It is an **imbalance between the nutrients the body needs** and the **nutrients it receives**.
  - It encompasses both **undernutrition** (including **stunting** (low height for age), **wasting** (low weight for height), and **underweight** (low weight for age)) and **overnutrition** (overweight and **obesity**), posing a **dual burden on public health.**
- **Anaemia:** Anaemia is a condition of low red blood cells or **haemoglobin**, reducing oxygen supply to tissues, mainly affecting women and children.

What are the Key Findings of the Study?

- **Slow and Insufficient Progress**: Across 204 countries, there has been slow and insufficient progress in meeting the **GNTs from 2012 to 2021,** with projections up to 2050 showing limited success.
  - Few countries are expected to meet the targets for **stunting** in children under 5.
  - None of the countries are projected to meet the targets for **low birth weight**, **anaemia**, and **childhood overweight** by 2030.
- **Anaemia and India**: Anaemia in India has **remained static for two decades.**
  - **Iron deficiency** is assumed to be the cause **but accounts for only one-third of anaemia cases,** unknown causes contribute to the other significant third.
  - Anaemia prevalence increased during the **Covid-19 lockdown** when school meals (**Midday Meal Scheme**) stopped, highlighting the need for a broader nutrition approach.

- The study found discrepancies in **anaemia measurements,** in India, **venous blood-based** (blood is drawn from a vein) **anaemia prevalence** (as recommended by **WHO)** was half that of **capillary blood-based** (blood is taken from a fingertip) **prevalence** in national surveys.
- **Stunting**: Stunting often develops within the **first two years of life,** increasing from 7–8% at birth to 40% by age two in India.
  - Overfeeding children after age **2 years may lead to being overweight rather than correcting stunting.**
  - Poor children in India consume only **7 grams of fat per day**, against the required 30–40 grams .
- **Childhood Overweight**: Overweight among children is increasing globally, including in India, contributing to **"metabolic overnutrition,"** which could lead to **chronic health problems** such as non-communicable diseases.
  - A significant portion of **Indian children (50%)** face **metabolic overnutrition,** which contributes to non-communicable diseases.
- **Recommendations: Diversify diets to address anaemia,** as it's not solely caused by iron deficiency.
  - Focus on **prevention of stunting in the first two years of life.**
  - Improve **energy intake, particularly fat intake,** for children under 3.
  - Adopt **more accurate and context-specific methods** for measuring anaemia and stunting.
    - Address both **undernutrition and overnutrition in policy** to prevent **non-communicable diseases.**

What are the Challenges for Achieving GNTs?

- **Global:**
  - **Persistent Anemia:** The global prevalence of anemia among women of reproductive age **has remained largely unchanged**.
    - Anaemia burdens **low-income countries, especially rural, poor, and uneducated populations**, due to **insufficient awareness and targeted policies.**
  - **Slow Progress on Stunting:** Despite efforts, the number of stunted children is projected to reach **127 million by 2025**, missing the target of 100 million, due to a **lack of early policies targeting the initial days of a child's life.**
  - **Rising Overweight and Obesity:** The rising prevalence of overweight and obesity, affecting **37 million children under 5 and over 390 million children and adolescents aged 5–19 in 2022,** is driven by factors such as urbanization, changing dietary patterns, and reduced physical activity.
  - **Childhood Wasting:** Childhood wasting affects an estimated 45 million children under 5 globally.
    - Childhood wasting prevention faces challenges like **food insecurity, limited healthcare, and poor sanitation,** especially in South Asia.
- **India:**
  - **Limited Dietary Diversity:** Diets in India are often dominated by **rice, wheat, and cereals**, with insufficient intake of **fruits, vegetables, dairy, and proteins,** leading to poor nutrition.
    - The lack of dietary diversity, especially among **lower-income households,** limits access to essential micronutrients.
    - The **National Family Health Survey (NFHS)-5** found that only **11.3% of children aged 6 months to 2 years** receive a 'minimum acceptable diet' as per WHO standards, highlighting significant gaps in both food quality and feeding frequency.
  - **Economic Barriers:** A significant portion of the population **struggles to afford a nutritious diet** due to low incomes and **high food prices**, contributing to **malnutrition.**
  - **Inadequate Data**: The absence of **comprehensive national surveys** on dietary diversity hampers targeted nutrition interventions.
    - While the **NFHS** provides some insights, it lacks detailed data on the quantities of food consumed, limiting its utility in addressing nutrition gaps.

- **Non-Communicable Diseases (NCDs):** The rising diet-related **NCDs like obesity, diabetes, and hypertension** is increasing the burden on public health systems, requiring more focus on addressing both **under- and over-nutrition.**
- **Food Systems Constraints: Climate change and extreme weather events** further threaten food security, impacting crop yields and the availability of diverse foods.

India's Initiatives Related to Nutrition

- **Mission Poshan 2.0**
- **Integrated Child Development Services (ICDS) Scheme**
- **Pradhan Mantri Matru Vandana Yojana (PMMVY**
- **Mid-Day Meal Scheme**
- **Scheme for Adolescent Girls (SAG)**
- **Mother's Absolute Affection (MAA)**
- **Poshan Vatikas**

Way Forward

- **Policy Realignment:** Incorporate flexible and region-specific dietary solutions in national programs like **POSHAN Abhiyaan** and promote initiatives like **National Millets Mission (NMM).**
  - Address systemic gaps in the **Public Distribution System (PDS)** to include nutrition-dense food items.
- **Set National-Level Targets:** Establish baselines and annual reduction goals specific to country contexts.
- **Strengthen Resource Allocation:** Mobilize **financial and human resources to implement nutrition-specific** and nutrition-sensitive programs.
- **Integrate Nutrition Across Sectors:** Incorporate nutrition outcomes into health, food systems, and **water, sanitation, and hygiene (WASH)** policies.
  - Strengthen **primary healthcare for effective maternal and child nutrition** services.
- **Develop Monitoring Mechanisms:** Enhance surveillance systems to track progress on selected nutrition indicators.

> ***Drishti Mains Question:***
>
> Discuss the Global Nutrition Targets endorsed by the World Health Assembly and the challenges in achieving them.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q. Which of the following is/are the indicator/indicators used by IFPRI to compute the Global Hunger Index Report? (2016)

1. Undernourishment
2. Child stunting
3. Child mortality

Select the correct answer using the code given below:

(a) 1 only

(b) 2 and 3 only

(c) 1, 2 and 3

(d) 1 and 3 only

Ans: (c)

Q. How do District Rural Development Agencies(DRDAs) help in the reduction of rural poverty in India? (2012)

1. DRDAs act as Panchayati Raj Institutions in certain specified backward regions of the country.
2. DRDAs undertake area-specific scientific study of the causes of poverty and malnutrition and prepare detailed remedial measures.
3. DRDAs secure inter-sectoral and interdepartmental coordination and cooperation for effective implementation of anti-poverty programmes.
4. DRDAs watch over and ensure effective utilization of the funds intended for anti-poverty programmes.

Which of the statements given above is/are correct?

(a) 1, 2 and 3 only

(b) 3 and 4 only

(c) 4 only

(d) 1, 2, 3 and 4

Ans: (b)

Mains:

Q. Can the vicious cycle of gender inequality, poverty and malnutrition be broken through microfinancing of women SHGs? Explain with examples. **(2021)**

Q. Despite Consistent experience of high growth, India still goes with the lowest indicators of human development. Examine the issues that make balanced and inclusive development elusive. **(2019)**

67th Foundation Day of DRDO

For Prelims: Defence Research and Development Organisation, unmanned aerial vehicles, sonar systems, Air Defence Tactical Control Radar , Long Range Land Attack Cruise Missile , Quick Reaction Surface to Air Missile , Trishul, Akash,BrahMos

For Mains: Contributions of DRDO in India's defense sector, Defense Technologies

Why in News?

Recently, the **Defence Research and Development Organisation (DRDO)** celebrated its **67th Foundation Day on 1st January** and paid tributes to former President **Dr. APJ Abdul Kalam,** the **Missile Man of India**

- The event highlighted the significant strides DRDO has made in bolstering India's defense capabilities.

What are the Key Facts About DRDO?

- **About:** DRDO was established in 1958 by merging the **Technical Development Establishment (TDEs)** of the Indian Army, the **Directorate of Technical Development and Production (DTDP)**, and the **Defence Science Organisation (DSO).**
    - **DRDO** is the R&D wing of the **Ministry of Defence**, Government of India.
    - DRDO initially had 10 laboratories, it currently operates 41 laboratories and 5 **DRDO Young Scientist Laboratories (DYSLs).**
- **Philosophy:** The guiding principle of DRDO is **"Balasya Mulam Vigyanam" (Strength lies in science),** driving the nation in both peace and war.
- **Mission:** Achieve **self-reliance in critical defence technologies** and systems while equipping the Indian armed forces with state-of-the-art weapon systems and equipment, as per the requirements of the three Services.
- **Technology Clusters of DRDO:** A committee under the chairmanship of **Dr. P. Rama Rao** was constituted in 2007 to conduct a comprehensive review of the DRDO.
    - This led to the creation of **seven technology domain-based clusters,** each headed by a Director General.
    - **Aeronautics Systems (Aero):** Focuses on **unmanned aerial vehicles (UAVs)**, aerostats, and related technologies.
    - **Missiles and Strategic Systems (MSS):** Develops **missile systems, including long and short-range missiles,** and related technologies.
    - **Naval Systems and Materials (NSM):** Works on naval platforms, underwater systems, including **sonar systems** and submarine technologies.
    - **Micro Electronic Devices (MED) and Computational Systems (CoS):** Focuses on electronics, radars, **cyber security,** and **artificial intelligence** for defense applications.
    - **Armament and Combat Engineering Systems (ACE):** Involves the development of **armaments, ammunition, explosives**, and combat vehicles.
    - **Electronics and Communication Systems (ECS):** Specializes in military **electronics, sensors, communication systems,** and electronic warfare technologies.
    - **Soldier Support System (SSS):** Equipping the **armed forces with advanced weapon systems** must be complemented by optimizing the psychological, physiological, and nutritional well-being of personnel.
- **Key Achievements of DRDO:**
    - **Achievements of DRDO in 2024:**
        - **System Handovers:** DRDO handed over multiple advanced systems notable systems include:
            - **Air Defence Systems: Air Defence Tactical Control Radar (ADTCR),** Air Defence Fire Control Radar (ADFCR).
            - **Missile Systems: Long Range Land Attack Cruise Missile (LR-LACM)** , **Quick Reaction Surface to Air Missile (QRSAM),** and **Medium Range Anti-ship Missile (MRAshM).**
            - **Advanced Platforms:** Multi-Mission Maritime Aircraft (MMMA), SCA (Signal Intelligence and COMJAM Aircraft), and **Anti-Tank Influence Mine PRACHAND.**
        - **AI Tools:** DRDO developed **'Divya Drishti,'** an AI tool that integrates face recognition with **immutable physiological traits** like gait (pattern of walking) and skeleton.

- **Flagship Programs:** Two flagship programs **Full Scale Engineering Development (FSED) of Advanced Medium Combat Aircraft (AMCA)** and a new **Missile Test Range in Andhra Pradesh**, were sanctioned by the **Cabinet Committee on Security (CCS).**
  - **Missile Systems:**
    - **Air-to-Air Missile: MICA, Astra Missile**
    - **Surface-to-Air Missiles: Trishul, Akash,** Barak 8
    - **Surface-to-Surface Missiles: Agni, Prithvi,** Dhanush, **Shaurya**
    - **Cruise Missiles: BrahMos**, Nirbhay
  - **Combat Aircraft: Indigenous Fighter Jet Light Combat Aircraft (LCA) Tejas.**
  - **Rocket Systems: Multi-barrel rocket launcher Pinaka.**
  - **Naval Systems: Humsa,** Nagan (sonar system), Ushus (Submarine Sonar Suite), Mihir (helicopter sonar system).
  - **Main Battle Tank: Arjun.**
  - **Unmanned Aerial Systems (UAS):**
    - **Lakshya:** Reusable aerial target system for training, launched from land/ship with tow targets.
    - **Nishant:** Multi-mission **UAV** for surveillance and artillery correction with autonomous flight and parachute recovery.

What are the Contributions of Dr. APJ Abdul Kalam to DRDO?

- **Leadership in IGMDP:** Dr. Kalam was instrumental in the creation and execution of the **Integrated Guided Missile Development Program (IGMDP)**, launched in 1983.
  - His leadership led to the successful development of the **Prithvi, Trishul, Akash, Nag, and Agni missiles,** positioning India as a member of the **exclusive group of missile-producing nations** and earning him the title of **'Missile Man of India.'**
  - Under Dr. Kalam's leadership, DRDO achieved breakthroughs in missile technologies like **propulsion, navigation, control systems, and aerodynamics,** leading to **indigenous missile systems** and reduced dependency on foreign suppliers.
- **Integrated Guided Missile Development Program:** The IGMDP was a program initiated by the **Indian Ministry of Defence** in 1982–1983 under the leadership of **Dr. APJ Abdul Kalam,** aimed at researching and developing a wide array of missiles.
  - The program's primary objective was to **reduce dependency on imports and build indigenous expertise** in areas such as propulsion, navigation, and control systems.
  - The program resulted in the development of key missile systems such as **Prithvi, Trishul, Akash, Nag, and Agni.**
  - Concluding in 2008, IGMDP also provided significant technological spin-offs, strengthened India's strategic deterrence, and contributed to the development of the **defense-industrial base**, in alignment with the **'Make in India' initiative.**

Key Facts About Dr. APJ Abdul Kalam

- **Born:** Dr. Avul Pakir Jainulabdeen Abdul Kalam born on **15th October 1931,** Rameswaram, Tamil Nadu.
- **President:** Served as India's **11th President from 2002 to 2007.**
- **Awards: Padma Bhushan (1981), Padma Vibhushan (1990),** and **Bharat Ratna** (1997).
- **Literary Works:** *Wings of Fire*, *India 2020 - A Vision for the New Millennium*, *My Journey*, *Ignited Minds*.
- **Contributions:**
  - **ISRO:** Project Director for India's first indigenous **Satellite Launch Vehicle (SLV-III).**
    - Successfully launched the **Rohini satellite** into near-earth orbit (July 1980).
    - Played a key role in evolving ISRO's launch vehicle program, particularly in developing configurations for **PSLV (Polar Satellite Launch Vehicle)** configuration.
    - Pioneer at ISRO, leading the development of **fiberglass technology** (fibrous form of glass).
    - **Pokhran-II:** Led India's nuclear tests in collaboration with the **Department of**

Atomic Energy, making India a nuclear weapon state.
- **Pokhran-II:** Dr. Kalam led the **Pokhran-II nuclear tests in 1998,** which were conducted in collaboration with the **Department of Atomic Energy.**
- **Vision 2020:** Proposed a national plan to transform India from a developing to a developed nation by 2020.
- **Kalam-Raju Stent:** Co-developed an affordable stent for **coronary heart disease with cardiologist B. Soma Raju.**

Drishti Mains Question:

Discuss the role of DRDO in India's journey towards self-reliance in defense technologies, with specific reference to the Integrated Guided Missile Development Program.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. In the context of Indian defence, consider the following statements: (2009)

1. The Shourya missile flies with a speed of more than 8 Mach.
2. The range of Shourya missile is more than 1600 km.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: (d)

Q. Which one of the following is the best description of 'INS Astradharini', that was in the news recently? (2016)

(a) Amphibious warfare ship

(b) Nuclear-powered submarine

(c) Torpedo launch and recovery vessel

(d) Nuclear-powered aircraft carrier

Ans: (c)

Mains:

Q. How is S-400 air defence system technically superior to any other system presently available in the world? **(2021)**

SBI Reports Decline in Poverty in India

[**Source: TOI**](#)

Why in News?

A recent research report by the **State Bank of India (SBI)** highlights a remarkable **decline in poverty rates across rural and urban India**.

- The report attributes this decline to targeted government interventions, enhanced rural infrastructure, and improved consumption patterns among lower-income groups.

What are the Key Findings of the SBI Report?

- **Decline in Poverty Rates:**
    - **Rural Poverty:** Reduced to **4.86%** in FY24 from 25.7% in 2011-12.
    - **Urban Poverty:** Estimated at **4.09%** in FY24, down from 13.7% in 2011-12.

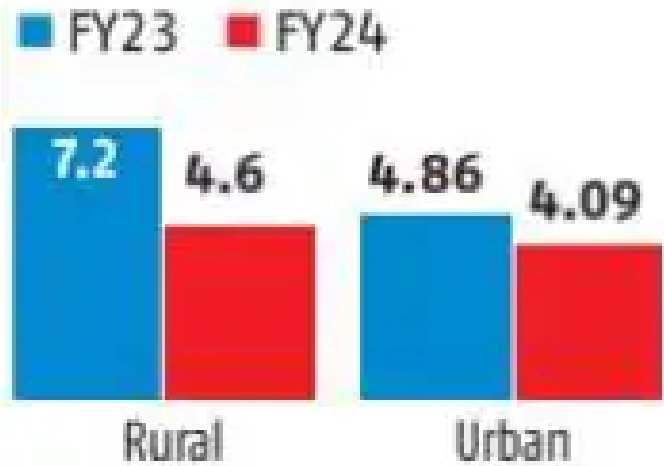Estimates of Poverty Ratio using Household Consumption Expenditure Survey
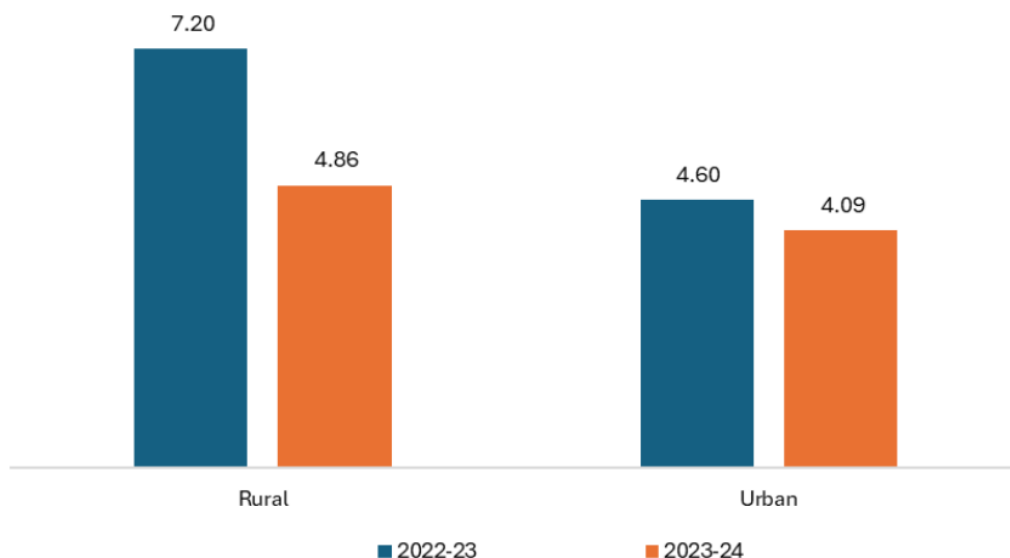
- **Impact of Government Interventions: [Direct Benefit Transfers (DBT)](#), infrastructure development**, and **farmer-centric initiatives** have improved rural livelihoods and reduced consumption inequality.
    - **Targeted programs** addressing income support and social security have significantly **benefited lower deciles of income groups.**
- **Improved Consumption in Rural Areas: Rural consumption is growing rapidly** and catching up with urban consumption. The rural **Monthly Per Capita Consumption Expenditure (MPCE)** i.e. difference between urban and rural consumption, measured as a percentage of rural consumption, **has been declining.**
    - It reduced to **69.7% in 2023-24** from **88.2% in 2004-05**, showing a narrowing gap between rural and urban spending.
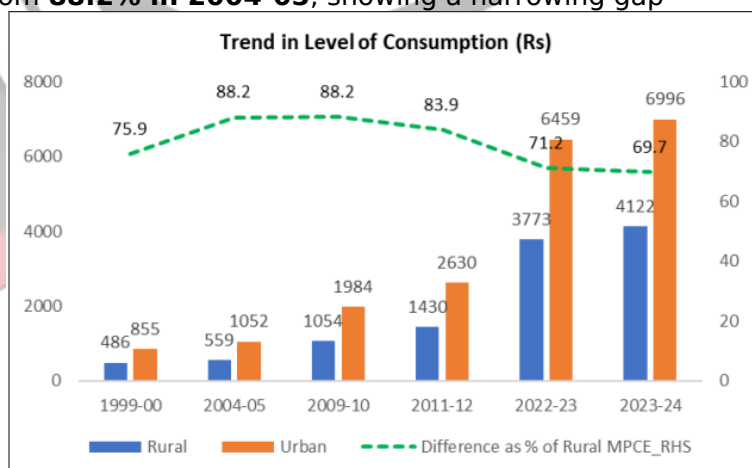
    - This has also been supported by data from the **latest Household Consumption Expenditure Survey (August 2023–July 2024)** which indicated a decreasing **gap in MPCE between urban and rural areas from 84% in 2011-12** to **71% in 2022-23,** and further to **70% in 2023-24**.
- **Poverty Line Definition:** The estimated **[poverty line](#)** in FY24 is **Rs 1,632 for rural areas** and **Rs 1,944 for urban areas** after adjusting for inflation and imputation factors**.**
    - Earlier, in 2011-12, the **[Tendulkar Committee](#)** had determined the poverty threshold to be Rs 816 for rural regions and Rs 1,000 for urban regions.
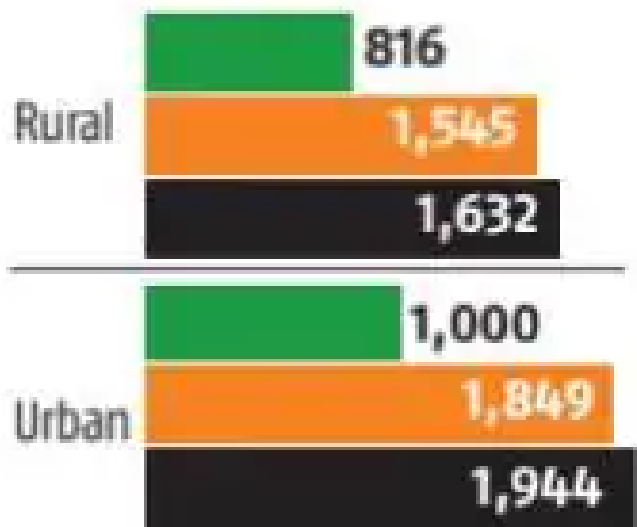
DROP IN DEPRIVATION

Poverty ratio using household consumption survey (in %)

■ FY23 ■ FY24

Rural: 7.2 (FY23), 4.6 (FY24)
Urban: 4.86 (FY23), 4.09 (FY24)

Inflation adjusted poverty line (in ₹)

■ FY12 ■ FY23 ■ FY24

Rural: 816 (FY12), 1,545 (FY23), 1,632 (FY24)
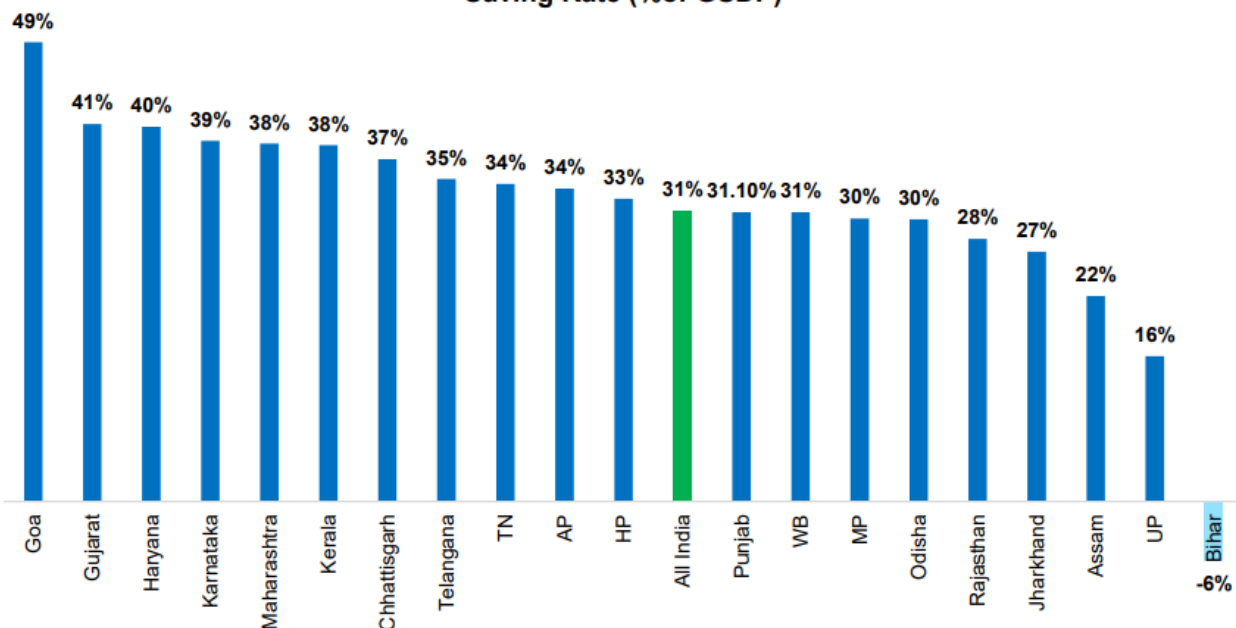**Urban:** 1,000 (FY12), 1,849 (FY23), 1,944 (FY24)

Source: SBI Report

- **State-wise Savings:** The state-wise savings rate was estimated using MPCE and **Per Capita Income**, factoring in the rural and urban population distribution.
  - States with **higher incomes** report savings rates **above the national average of 31%**, indicating **stronger financial stability**.
  - **Low-income states** like **Uttar Pradesh** and **Bihar** show **low savings rates** which is likely due to **high outward migration**, which affects **income retention** and **consumption patterns**.
    - Bihar is the **only state showing a negative saving rate at -6%**
  - There's a **significant disparity** between the **highest (Goa: 49%)** and **lowest (Bihar: -6%) saving rates.**

Saving Rate (%of GSDP)

State	Saving Rate
Goa	49%
Gujarat	41%
Haryana	40%
Karnataka	39%
Maharashtra	38%
Kerala	38%
Chhattisgarh	37%
Telangana	35%
TN	34%
AP	34%
HP	33%
All India	31%
Punjab	31.10%
WB	31%
MP	30%
Odisha	30%
Rajasthan	28%
Jharkhand	27%
Assam	22%
UP	16%
Bihar	-6%

- **Impact of Inflation:**
    - **Elasticity of Consumption Demand:**
        - **Consumption demand is elastic (|e| > 1)**, meaning that **changes in food prices significantly impact overall spending** including food expenditures.
        - Rising food prices lead to a **decrease in MPCE**, with the **negative elasticity in both low- and high-income states** indicating that **higher food inflation reduces consumption**, in line with the **law of demand**.
            - Rural areas in low-income states are more severely affected by rising food prices, reflecting greater vulnerability.
        - In contrast, **lower food inflation boosts MPCE in middle-income states,** where **positive elasticity** indicates that **reduced food inflation enhances consumption and sustains demand.**
            - Urban segments of middle-income states show significant increases in MPCE with falling food inflation.
    - **Regional Disparities:**
        - The **impact of the rural-urban gap is small in low-income states** but **more noticeable in high-income states**.
        - This indicates that **rural people in low-income states are more cautious** about taking risks than those in high-income states.

Government Initiatives to Alleviate Poverty

- **Prime Minister Street Vendor's AtmaNirbhar Nidhi – PM SVanidhi**
- **Pradhan Mantri Shram Yogi Maan-Dhan (PM-SYM)**
- **National Nutrition Mission (NNM)**
- **Pradhan Mantri Garib Kalyan Yojana (PMGKY)**
- **Pradhan Mantri Suraksha Bima Yojana**

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q. Increase in absolute and per capita real GNP do not connote a higher level of economic development, if (2018)

(a) industrial output fails to keep pace with agricultural output.

(b) agricultural output fails to keep pace with industrial output.

(c) poverty and unemployment increase.

(d) imports grow faster than exports.

Ans (c)

Q.In a given year in India, official poverty lines are higher in some States than in others because (2019)

(a) poverty rates vary from State to State

(b) price levels vary from State to State

(c) Gross State Product varies from State to State

(d) quality of public distribution varies from State to State

Ans (b)

Q. The Multi-dimensional Poverty Index developed by Oxford Poverty and Human Development Initiative with UNDP support covers which of the following? (2012)

1. Deprivation of education, health, assets and services at household level
2. Purchasing power parity at national level
3. Extent of budget deficit and GDP growth rate at national level

Select the correct answer using the codes given below:

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

Ans (a)

LEADS 2024 Report

Source: PIB

Why in News?

Recently, the **Ministry of Commerce & Industry** released the **6th Logistics Ease Across Different States (LEADS) 2024** report.

- **GatiShakti Vishwavidyalaya (GSV)** launched a course on **PM GatiShakti Concept for Efficient Infrastructure Planning and National Development.**

What are the Key Highlights of the LEADS 2024 Report?

- **About:** It is an annual assessment released by the **Ministry of Commerce and Industry** to promote **inter-state competitiveness** and help policymakers improve logistics performance.
  - LEADS was conceived on the lines of the **Logistics Performance Index (LPI)** of **World Bank** in 2018.
- **Objective:** It aims to evaluate logistics performance across **States and Union Territories (UTs)** to identify **reforms, attract investments**, and improve **logistics efficiency.**
- **Evaluation:** The report assesses logistics performance based on **four key pillars:**
  - Logistics Infrastructure
  - Logistics Services
  - Operating and Regulatory Environment
  - **Sustainable Logistics** (introduced in 2024).
- **Ranking of States and UTs in 2024:**

Group	Achievers	Fast Movers	Aspirers
Coastal States	Gujarat, Karnataka, Maharashtra, Odisha, Tamil Nadu	Andhra Pradesh, Goa	Kerala, West Bengal

Landlocked States	Haryana, Telangana, Uttar Pradesh, Uttarakhand	Bihar, Himachal Pradesh, Madhya Pradesh, Punjab, Rajasthan	Chhattisgarh, Jharkhand
North-Eastern States	Assam, Arunachal Pradesh	Meghalaya, Mizoram, Nagaland, Sikkim, Tripura	Manipur
Union Territories	Chandigarh, Delhi	Dadra and Nagar Haveli & Daman and Diu, Jammu & Kashmir, Lakshadweep, Puducherry	Andaman and Nicobar Islands, Ladakh

- **Key Recommendations:**
    - The logistics sector needs to adopt the **LEAD framework** to transform the logistics sector.
        - LEAD framework includes **Longevity, Efficiency and Effectiveness, Accessibility and Accountability, and Digitization of processes.**
    - Promotion of **green logistics** and sustainable transport initiatives.
    - Encouraging **public-private partnerships (PPPs)** to enhance multi-modal logistics hubs.
    - Develop **regional and city-level logistics plans** as well for last-mile connectivity.
    - Promote **gender inclusivity**
    - Adopt new technologies like **Artificial Intelligence (AI), Machine Learning (ML), and Data Analytics** for enhanced logistics performance.

India's Logistics Sector

- **Contribution:** It contributes **13-14% to India's GDP** and provides livelihood to over **22 million people**; projected to add **1 crore jobs by 2027**.
    - **In FY22,** India's logistics market stood at **USD 435 billion** and is projected to expand to **USD 591 billion by FY27**.
- **Logistics Costs:** Presently, India's **logistics cost is 13-14% of GDP** which is extremely high.
    - The **National Logistics Policy (NLP) 2022** aims to reduce India's logistics costs to align with global benchmarks of **8-9% of GDP.**
- **Global Position:** India ranked **38th among 139 countries** in the World Bank's **Logistics Performance Index Report 2023**.
    - The LPI is an **interactive tool** developed by the **World Bank** that helps countries **identify challenges and opportunities** in trade logistics and **improve their performance**.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q. With reference to 'National Investment and Infrastructure Fund', which of the following statements is/are correct? (2017)

1. It is an organ of NITI Aayog.
2. It has a corpus of Rs 4,00,000 crore at present.

Select the correct answer using the code given below:

(a) 1 only

(b) 2 only

(c) Both 1 and 2

CBI Exempt from State Consent for Central Employees

Source: IE

Why in News?

Recently, the **Supreme Court (SC)** ruled that **CBI** can register cases under **Central laws**, like the **Prevention of Corruption Act, 1988** against **Central government employees in states without state consent.**

- The SC **overturned** an **Andhra Pradesh High Court** ruling that **quashed two FIRs** against Central government employees due to the **lack of Telangana's consent to prosecute them.**

What is State Consent for CBI?

- **About:** It refers to the requirement for the **CBI to obtain permission** from a state government before investigating cases within that state's territorial jurisdiction.
    - It stems from the **federal structure** of the Indian Constitution, which delineates the **powers of the central and state governments**.
- **Legal Basis**: **Section 6** of the **Delhi Special Police Establishment (DSPE) Act, 1946** requires **CBI** to obtain state consent for investigations **unless directed by the judiciary or central government for specific purposes.**
- **Types of Consent**:
    - **General Consent**: States grant **blanket permission** for the CBI to operate within their jurisdiction without seeking case-specific approval.
    - **Specific Consent**: When general consent is not granted, the CBI must seek **case-specific permission** from the state government.

What is CBI?

- **About:** The CBI was established in **1963** by a resolution of the **Ministry of Home Affairs** following recommendations by the **Santhanam Committee on Prevention of Corruption (1962–1964).**
    - It acts as the **nodal police agency** for coordinating investigations with **Interpol member countries.**
- **Functioning:** It derives its investigative powers from the **Delhi Special Police Establishment Act, 1946.**
    - It operates under the **Ministry of Personnel, Public Grievances, and Pensions,** which falls under the Prime Minister's Office.
- **Supervision Over CBI:** The **Central Vigilance Commission (CVC) oversees** the CBI's supervision in investigating offences under the **Prevention of Corruption Act, 1988.**
    - In other matters, it lies with the **Department of Personnel & Training (DOPT)** in the Ministry of Personnel, Pension & Grievances of the Government of India.
- **Appointment of CBI Director:** Under the **Lokpal Act, 2014,** a committee comprising the **Prime Minister, Leader of the Opposition, and Chief Justice of India** (or a Supreme Court Judge) recommends the appointment.
    - The Director enjoys a tenure security of **2 years**, **extendable up to 5 years** in the public interest.

Prelims

Q. With reference to the Indian judiciary, consider the following statements:

1. Any retired judge of the Supreme Court of India can be called back to sit and act as a Supreme Court judge by the Chief Justice of India with the prior permission of the President of India.
2. A High Court in India has the power to review its own judgement as the Supreme Court does.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither I nor 2

Ans: (c)

World Braille Day 2025

Source: TH

World Braille Day, celebrated on 4th January, commemorates the birth of **Louis Braille,** the inventor of **Braille, a tactile code** that empowers **blind and visually impaired** individuals to **access written information.**

- **Louis Braille:** Louis Braille (1809–1852) was born in France, and lost his sight at the age of three.
    - At ten, he received a scholarship to the Royal Institute for Blind Youth in Paris, where he developed the **Braille system** after being inspired by an army captain's **"night writing" system.**
        - The "night writing" system, created by **Charles Barbier de la Serre** in 1815, used **12 raised dots** and was designed for soldiers to communicate silently in the dark.
- **Braille System:** It uses 6 raised dots in a **3 × 2 matrix** to form characters, distinguishable by their arrangement.
    - Braille can be written with various tools, including slates, braille writers, and electronic devices.
    - Despite the rise of **Artificial Intelligence (AI)** and voice technologies, Braille remains crucial for independence, especially for those congenitally blind.

Read more: World Braille Day

Department of Scientific and Industrial Research

Source: PIB

The **Department of Scientific and Industrial Research (DSIR)** celebrated its 40th Foundation Day on **4th January 2025,** marking four decades of contributions to India's scientific and industrial development.

- **DSIR:** It was established on 4th January 1985, under the **Ministry of Science and Technology** through a **Presidential Notification** under the **164th Amendment of the Government of India (Allocation of Business) Rules, 1961.**
  - DSIR focuses on promoting **indigenous technology development, utilization, and transfer.**
  - DSIR oversees the **Council for Scientific and Industrial Research (CSIR), National Research Development Corporation (NRDC)** and **Central Electronics Ltd (CEL).**
  - DSIR supports the **Asian and Pacific Centre for Transfer of Technology (APCTT)** under **United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP),** advancing scientific and industrial progress in India.
- **DSIR Key Schemes:**
  - **PRISM**: **Promoting Innovations in Individuals, Start-ups and MSMEs (PRISM) scheme** supports innovators and MSMEs fostering inclusive development as outlined in the **12th Five-Year Plan (2012-2017).**
  - **PACE**: The **Patent Acquisition and Collaborative Research and Technology Development (PACE)** supports industries in developing and commercializing innovative technologies.
  - **CTRDH**: **Common Research and Technology Development Hubs (CRTDHs)** provides shared infrastructure and technology support for MSMEs.
  - **A2K+**: **Access to Knowledge for Technology Development and Dissemination (A2K+)** promotes the dissemination of tech and innovation information to industries and research bodies.

Read more: Council of Scientific & Industrial Research (CSIR)

HMPV Virus

The recent surge in **respiratory illnesses in China**, linked to **Human Metapneumovirus (HMPV)**, has sparked fears of another pandemic.

- However, the **World Health Organization (WHO)** has **not** reported a **new pandemic,** issued emergency warnings, or declared a health crisis related to HMPV.
- **About HMPV:**
    - **Discovery**: It was **discovered in 2001** by researchers in **the Netherlands. It** causes acute respiratory infections, similar to **flu and Covid-19.**
    - **Presence:** It is not limited to **China** and is found **all over the world**. It is clubbed as a **common respiratory pathogen**. It does **not** have a **vaccine.**
    - **Symptoms**: **Cough, fever, sore throat, runny nose**, and **wheezing**, which typically resolve within **2-5 days.**
    - **Vulnerable Groups: Children, the elderly,** and those with **weakened immune systems** are most at risk of complications like **pneumonia.**
    - **Transmission:** HMPV spreads through **close contact** or by **touching contaminated surfaces**.
    - **Seasonality:** It commonly circulates during **winter and spring**, along with other respiratory infections like **Respiratory Syncytial Virus (RSV)** and **influenza**.
        - HMPV belongs to the **Pneumoviridae family**, which includes **RSV, measles, and mumps viruses.**
    - **Severity**: While most HMPV cases are mild, a **small percentage (5-16%)** may develop into severe conditions like **bronchiolitis or pneumonia.**
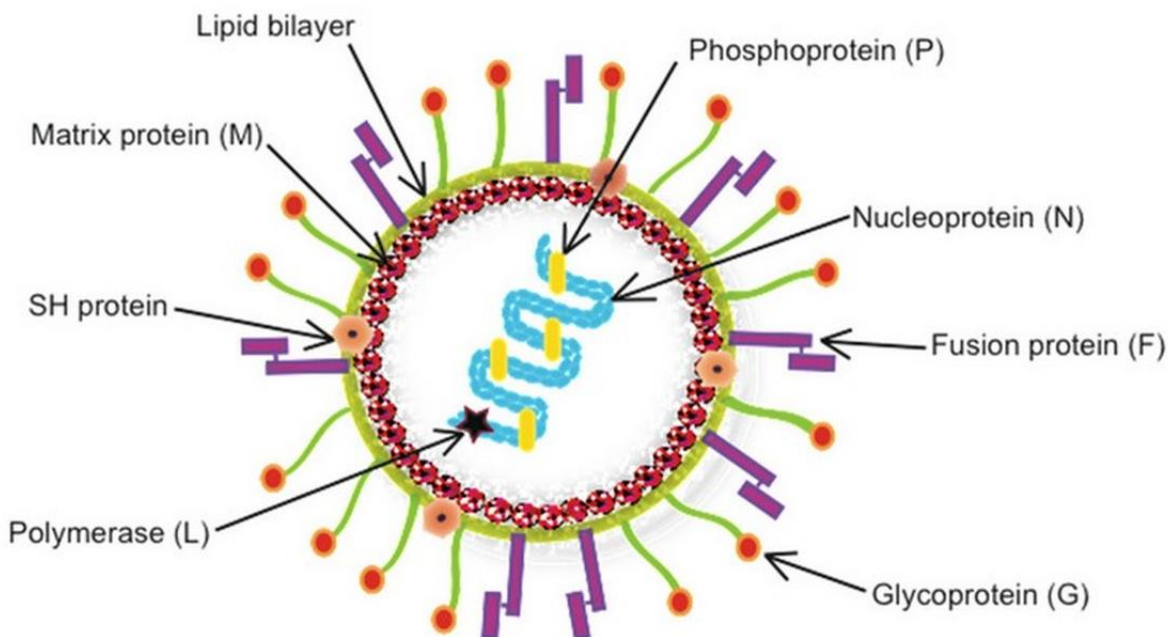
Read More: Impact of Covid-19 on Human Capital

Dinosaur Highway

Recently, hundreds of **dinosaur footprints**, dating back to the **Middle Jurassic Period** (around 166 million years ago), were discovered at **Dewars Farm Quarry in Oxfordshire, UK**, earning the site the nickname **"dinosaur highway"** due to the large number of footprints found.

- The footprints include **Sauropods, large herbivores like Cetiosaurus** (up to 60 ft), and **Megalosaurus, a 30-ft carnivore** with triple-claw prints.

DINOSAURS

Dinosaurs were reptiles that roamed Earth during the Mesozoic Era, also known as the "Age of Reptiles."

THE TYRANNOSAURUS REX (T. rex) is the most famous dinosaur.

The word "dinosaur" combines the Greek words **deinos** (meaning "terrible") and **sauros** (meaning "lizard").

ROAR!

Dinosaurs lived for about **165 million years.**

NATIONAL DINOSAUR DAY is celebrated on **May 15** (and also June 1).

The first dinosaur to be named was the **MEGALOSAURUS** in 1824.

The Argentinosaurus was **the largest dinosaur.** It was more than 100 feet long and about 50 feet tall.

BEST

Most dinosaurs were **herbivores** (vegetarians).

The dinosaur with **the longest name** is the **MICROPACHYCEPHALOSAURUS.**

The smallest dinosaur was the **Oculudentavis**. It was the size of a bee hummingbird, today's smallest bird, which measures about 2½ inches long.

GETTY IMAGES/ISTOCKPHOTO; HAN ZHIXIN/LOS ANGELES NATURAL HISTORY MUSEUM

- **Dinosaurs**: **Dinosaurs** were **prehistoric reptiles** that lived from about **245 million years ago** to **66 million years ago** during the **Mesozoic Era** (Triassic, Jurassic, Cretaceous periods).
    - Modern birds are descendants of non-avian dinosaurs.
- **Classification:**
    - **Ornithischia:** Beaked plant-eaters (e.g., Stegosaurus, Triceratops).
    - **Sauropodomorpha:** Long-necked herbivores (e.g., Diplodocus).
    - **Theropoda:** Carnivores (e.g., T. rex, Velociraptor), ancestors of birds.
- **Size:** Dinosaurs ranged from massive species like **Argentinosaurus (110 tons)** to small ones like the **bee hummingbird.**
- **Diet and Movement:**
    - **Meat-eaters**: Two-legged, hunted alone or in groups.

- **Plant-eaters:** Two or four-legged, grazed on plants.
- **Distinctive Feature:** The key feature distinguishing dinosaurs from other reptiles is the **hole in the hip socket, allowing upright walking.**
- **Extinction:** Dinosaurs went extinct around, likely due to an **asteroid impact** in the **Cretaceous period**, creating a crater in the **Yucatan Peninsula (Mexico).**
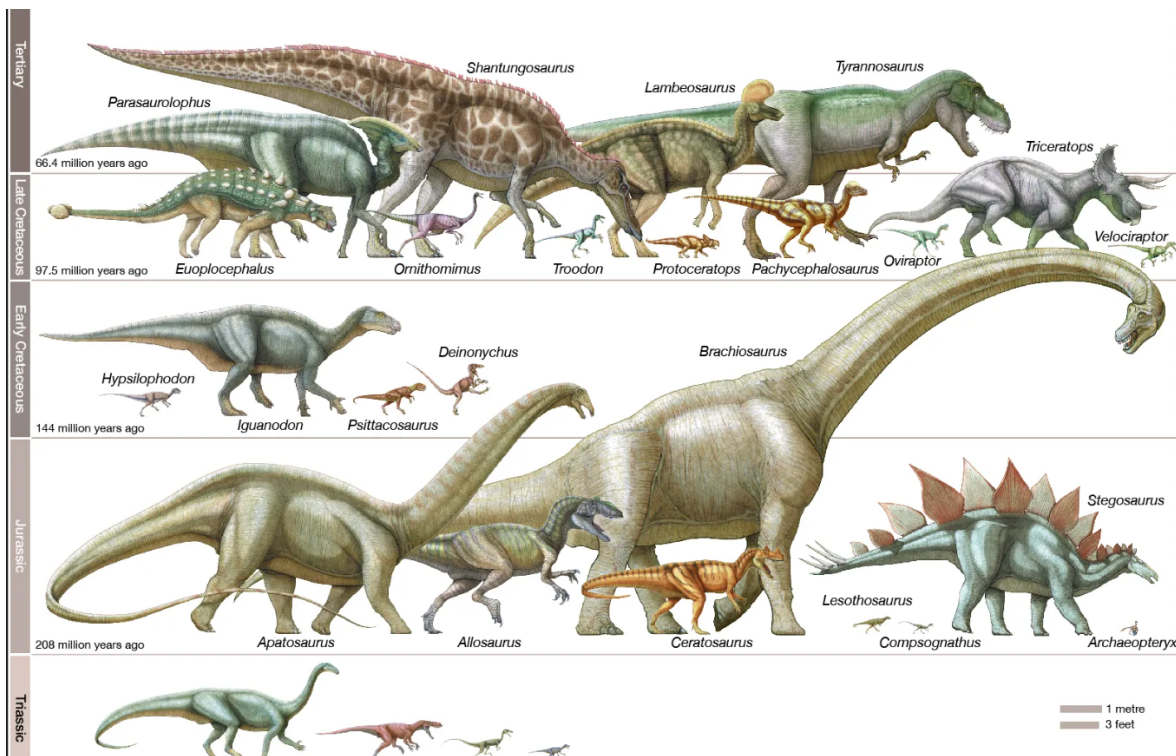
Read More: [Connection Between Dinosaurs and Birds](#)

193rd Birth Anniversary of Savitribai Phule

[Source: ET](#)

Recently, the **Prime Minister** paid tributes to **[Savitribai Phule](#)** on her **193rd birth anniversary** on **3rd January 2025.**

- Savitribai faced strong **opposition from orthodox society**, enduring physical and social assaults, including being **stoned and abused**.
- **About Savitribai Phule:**
  - **Born:** She was born **on 3rd January 1831**, in Satara, Maharashtra, to a marginalized **Mali community**. She was married to **[Jyotiba Phule](#)** who took charge of her education.
    - She was enrolled in **two teacher's training programs**: one with **American missionary Cynthia Farrar** in Ahmednagar and the other at a **Normal School, Pune**.
  - **Contributions:**
    - **Education for Women:** Established the first school for girls in **1848** in **Pune**. The couple started and ran **18 schools in total**.
    - **Efforts for Downtrodden:** Started educational trusts like the **Native Male School, Pune** and **Society for Promoting the Education of Mahar, Mangs** to uplift the Dalit community.

- **Combating Gender Issues:** In **1863,** Jyotirao and Savitribai founded **Balhatya Pratibandhak Griha**, India's first home to combat **female infanticide** and support **pregnant Brahmin widows and rape victims.**
- **Literature: Authored two famous works** namely *Kavya Phule* **(1854)** and *Bavan Kashi Subodh Ratnakar (1892)* in, along with the poem **Go, Get Education.**
  - **Jyotirao Phule**, a 19th-century **social reformer,** critiqued social oppression in his **book Gulamgiri** and founded the **Satyashodhak Samaj** in **1873** to promote education, equality, and **abolish untouchability.**

Read More: Savitri Bai Phule

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