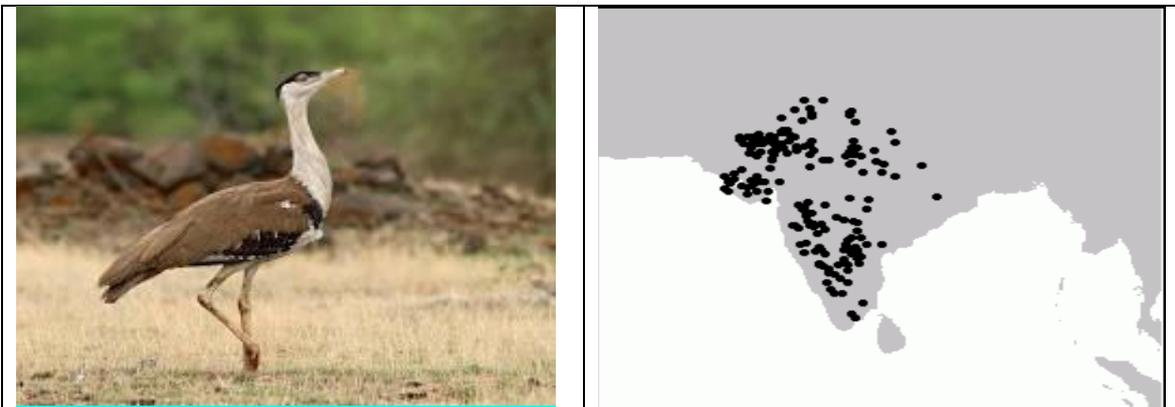


## TOPICS COVERED

1. SC stays govt. notification on establishing fact check unit. (GS Paper II: Polity)
2. Tamil Nadu Governor 'defying the Supreme Court', says CJI. (GS Paper II: Article 164)
3. Panel to study scope of altering power lines in bustard habitat. (GS Paper III: Environment)
4. Water, an instrument to build world peace (GS Paper III: Agriculture, Environment)
5. New capabilities: India and the Agni-V with MIRV (GS Paper III: S&T, Defence)
6. Should judges accept official posts after retirement? (GS Paper II: Judicial Independence)
7. Nuclear energy: fixing the finance | Explained (GS Paper III: Energy)
8. Why did Pakistan carry out airstrikes in Afghanistan? (GS Paper II: IR)
9. March flash PMI signals a sharp rise in output, new orders and hiring (GS Paper III: Manufacture Sector)

The **Great Indian Bustard/the Indian Bustard**, is a large, long-legged bird. It's one of the heaviest flying birds in the world.



Great Indian Bustard bird

- **Scientific Name:** *Ardeotis nigriceps*
- **Habitat:** Dry grasslands and scrublands
- **Distribution:** Once widespread across India, now mainly found in Rajasthan and Gujarat with smaller populations in Maharashtra, Karnataka and Andhra Pradesh
- **Height:** Up to 1.2 meters (4 feet)
- **Weight:** Up to 15 kg (33 lbs)
- **Conservation Status:** Critically Endangered

The Great Indian Bustard is critically endangered due to habitat loss and hunting.

# Water, an instrument to build world peace

(GS Paper III: Agriculture, Environment)

The theme this year is 'Water for Peace' pointing to the need for better water security, sustainable agricultural production, and environmental integrity

March 22, 2024 12:16 am | Updated 02:04 am IST

SUSAMA SUDHISHRI

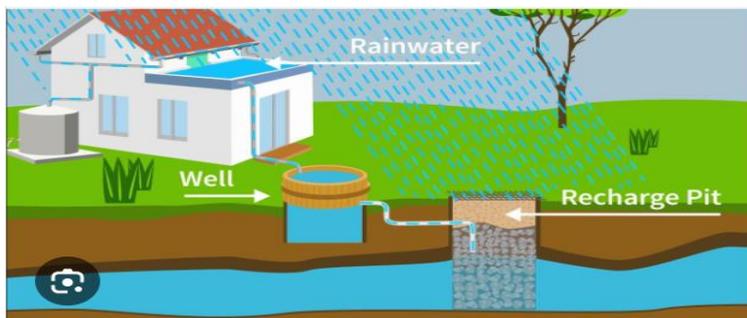
- **World Water Day** is observed globally on **March 22** each year since **1993** to raise awareness about freshwater.
- This year's theme is "**Water for Peace**", highlighting the importance of freshwater in promoting peace.
- There is a problem of water availability with respect to quantity or quality.
- Factors contributing to the **global water crisis** include **rapid urbanization, industrialization, unsustainable agricultural practices, climate change, erratic rainfall patterns, water overuse, pollution, and inadequate infrastructure, a lack of 'belongingness' among stakeholders, runoff due to high rain along with soil erosion and sedimentation.**
- **Water scarcity threatens ecosystems, food and water security, and ultimately affects peace.**
- According to the **World Resources Institute, 17 countries face "extremely high" levels of water stress**, which can lead to conflict and unrest among people.

## India too faces problems

- India is also affected by the water crisis, with water availability projected to decrease further by 2025 and 2050.
- The majority of water withdrawals in India are for agriculture (72%), followed by municipal (16%) and industrial (12%) use.
- Groundwater depletion is a significant issue in almost every state and major city in India, with examples like **Bengaluru** experiencing severe depletion.
- The ratio of **groundwater consumption to availability** is alarming in states like Punjab, Rajasthan, Delhi, and Haryana (172%, 137%, 137% and 133%, respectively).
- In contrast, states like Tamil Nadu, Uttar Pradesh, Gujarat, Madhya Pradesh, and Maharashtra have relatively better ratios (77%, 74%, 67%, 57%, and 53%, respectively).
- Many perennial rivers and streams in India now have **intermittent flows** or have run dry, leading to water scarcity after April-May.
- In India, the total number of water bodies is 5,56,601 whose irrigation potential covered 62,71,180 hectares.

- But, **due to a lack of or inappropriate catchment treatment measures, bad design and poor maintenance of water bodies, most of the reservoirs/waterbodies/wetlands have silted up, resulting in reduced storage capacity and lower efficacy.**
- **Tubewell density and networks** have increased in most areas, leading to excessive groundwater discharge compared to recharge.
- **Discharge of sewerage water and grey water** into water bodies and rivers is deteriorating water quality.
- Proper surface and groundwater management is lacking in many regions.
- **Rainfed regions in India cover over 48% of the land area and contribute nearly 45% of the gross agricultural product.**
- A significant portion of India's food grains comes from rainfed areas.
- Prime Minister Narendra Modi emphasized the need for **a balanced approach using traditional indigenous and new technologies** to improve soil health and conserve water and pitched for the efficient use of every drop of water.
- **Efficient use of water is crucial**, and attention to these points is essential for sustainable water management and agricultural productivity.

## The vital role of rainwater harvesting



- Water availability in terms of quantity and quality is crucial for various aspects including **human rights, peace-building, and overall quality of life.**
- **Sustainable agricultural production, water security, and environmental integrity** are increasingly important, requiring resource conservation measures.
- **Rainwater harvesting (RWH), both in-situ and ex-situ, and rooftop rainwater harvesting** are essential practices for enhancing **resilience against water scarcity and drought** by augmenting recharge and aiding irrigation.
- **Optimum use of surface water through large-scale RWH structures, conjunctive use with groundwater, and safe reuse of wastewater** are vital for maintaining food grain production.
- Government initiatives like **'per drop more crop', 'Gaon ka pani gaon mein', 'Khet ka pani khet mein', and programs like PMKSY, watershed management, Mission Amrit Sarovar, and Jal Shakti Abhiyan** focus on water conservation and rainwater harvesting.
- **There is an emphasis on** water conservation and rainwater harvesting, rejuvenation of waterbodies/tanks/wetlands, recharge of borewell and other recharge structures, watershed development and intensive afforestation.

- But there is the need for **a protocol of the revival of ponds/waterbodies** (it is unavailable right now), along with **comprehensive studies on water availability, quality, and ecosystem services in each water body**.
- Creation and revival of **water bodies in every village, considering the catchment-storage-command area** of each water body, are essential steps in addressing water scarcity and conservation.

## Additional steps

- **Monitoring groundwater table levels and reclaiming water quality in groundwater, rivers, and water bodies are crucial interventions.**
- **Implementing pricing mechanisms** for water use and **promoting a circular water economy** are essential for sustainable water management.
- Adoption of efficient irrigation techniques like **micro-irrigation systems and IoT-based automation** can improve water usage efficiency.
- **Integrated water resource management** is necessary for effective water conservation and distribution.
- **Installation of water meters** can help reduce domestic water consumption, while eliminating free electricity for water extraction can discourage wasteful practices.
- **Promoting community awareness and participation** through **awareness campaigns** is important for fostering a culture of water conservation.
- **Encouraging neutrality in groundwater and land use, cultivating low water requirement crops, and adopting optimal crop plans** can help conserve water.
- **Building resilience against climate change** and meeting the needs of a growing population require an integrated and inclusive approach to water management.
- **Measures such as reducing losses in water distribution systems**, promoting safe wastewater reuse, desalination, and appropriate water allocation are essential.
- Development of tubewells/borewells.
- **Enabling the integration and collaboration of research, industry and academia** to implement different developed and new technologies are vital for water security and peace.

### Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

- **Ministry:** Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation
- **Official Website:** <https://pmksy.gov.in/>
- **Focus:** **Expanding cultivable area under assured irrigation**, improving on-farm water use efficiency, and introducing sustainable water conservation practices.
- **Components:**
  - Har Khet Ko Pani (Water for Every Farm)
  - Per Drop More Crop (focus on water efficiency)
  - Watershed Development

### 2. Watershed Management

- **Ministry:** Ministry of Rural Development, Department of Land Resources
- **Official Website:** <https://dolr.gov.in/> (look under Integrated Watershed Management Programme)

- **Focus:** Conserving soil and water resources, increasing agricultural productivity, and ensuring ecological balance in rain-fed areas.
- **Key Activities:** Soil and water conservation measures, afforestation, rainwater harvesting structures, and livelihood generation activities.

### 3. Mission Amrit Sarovar

- **Ministry:** Ministry of Rural Development
- **Official Website:** <https://amritsarovar.gov.in/>
- **Focus:** **Developing and rejuvenating 75 water bodies in each district** of India to conserve water for the future.
- **Goal:** Create a network of ponds and lakes to increase water availability and support biodiversity.

### 4. Jal Shakti Abhiyan

- **Ministry:** Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation.
- **Official Website:** <https://jalshakti-dowr.gov.in/> (find Jal Shakti Abhiyan under important links)
- **Focus:** A time-bound, nationwide campaign for water conservation and rainwater harvesting.
- **Phases:** JSA: Catch the Rain (focus on urban areas), JSA 2.0 (larger scale with groundwater focus)

**MAINS PRACTICE QUESTION:** GS PAPER I: Geography, GS Paper III: Agriculture and Sustainable Development

Question: "The theme of World Water Day 2024, 'Water for Peace', underscores the vital role of water in fostering peace and enhancing quality of life." Discuss the significance of this theme in the context of India's water challenges and the importance of adopting an integrated approach to water management. (250 Words/15 Marks)

#### ANSWER APPROACH

- Introduce the answer with relevance of the theme of World Water Day 2024, 'Water for Peace'.
- Bring the challenges faced by India with respect the water need.
- Then elaborate on importance of adopting an integrated approach to water management.
- Further include the steps taken by the Indian government in this direction.
- Conclude suggestive remark in a positive tone.

#### ANSWER

The theme "Water for Peace" highlights the essential connection between water and peace-building efforts worldwide. It emphasizes the need to recognize water as a vital resource for promoting stability and enhancing the overall well-being of communities. In the context of India, a country grappling with severe water challenges, this theme holds immense significance. India account for around 17% of world population with just 2.4% of the World fresh water.

- India faces numerous challenges concerning water availability, quality, and management. Rapid urbanization, industrialization, unsustainable agricultural practices, and climate change have exacerbated water scarcity across the country.

- Groundwater depletion, pollution of water bodies, and erratic rainfall patterns further compound the challenges, posing threats to ecosystems, food security, and livelihoods.

#### **Importance of Adopting an Integrated Approach:**

- Addressing India's water challenges requires an integrated approach to water management. Such an approach involves implementing sustainable practices for water conservation, efficient utilization, and equitable distribution.
- It emphasizes the significance of managing water resources holistically to ensure long-term sustainability and resilience.

#### **The Indian government has taken several steps to address the water crisis and promote integrated water management:**

- **Policy Initiatives:** Initiatives like the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), watershed management programs, Mission Amrit Sarovar, and the Jal Shakti Abhiyan focus on water conservation, rainwater harvesting, and rejuvenation of waterbodies.
- **Technological Interventions:** Emphasis on utilizing traditional indigenous and new technologies to improve soil health, conserve water, and enhance agricultural productivity.
- **Community Participation:** Encouraging community awareness and participation through awareness campaigns and initiatives like "per drop more crop" to promote efficient water use in agriculture.
- **Infrastructure Development:** Investments in infrastructure development for water storage, distribution, and treatment to improve access to safe and clean water.

Thus by adopting an integrated approach to water management, India can effectively address its water challenges and contribute to sustainable development and peace-building efforts. It is imperative for stakeholders to collaborate, innovate, and implement holistic solutions to ensure water security for present and future generations.

# **New capabilities: India and the Agni-V with MIRV**

## **The choice of MIRV on Agni-V gives it range and ability to defeat defences**

March 22, 2024 12:20 am | Updated 01:29 am IST

- On March 11, Prime Minister Narendra Modi announced via social media that India had achieved the capability to **deliver multiple nuclear warheads on a single missile**.
- This achievement was made possible by the maiden flight test of **Agni-V, India's longest-range ballistic missile**, conducted under **'Mission Divyastra'** by the **Defence Research and Development Organisation (DRDO)**.

- Agni-V has a range of **over 5,000 kilometers** and is equipped with Multiple Independently Targetable Re-entry Vehicle (MIRV) technology.
- MIRV technology allows **a single missile to carry and deliver multiple warheads to different targets.**
- Agni-V has undergone several tests and developments since its first test in April 2012, including **canisterisation for improved handling and operation.**
- **The indigenous avionics systems and high accuracy sensor packages** of the MIRV system ensure precise delivery of the re-entry vehicles to their target points.
- The DRDO confirmed that the mission achieved its designed parameters successfully.
- This test comes five years after **India's first anti-satellite (ASAT) test under Mission Shakti,** conducted on March 27, 2019.
- **During Mission Shakti, a live satellite in low Earth orbit at around 300 kilometers was successfully intercepted and destroyed using a modified interceptor of the Ballistic Missile Defence system.**



Canistered test launch on 03 June 2018

### Canisterization

- It involves placing the missile inside a **sealed, protective canister.** This canister acts like a portable launch container.
  - **Not just the outer shell:** The canister has **built-in systems for environmental control (temperature, humidity), shock absorption during transport, and the mechanisms to eject the missile during launch.**
  - The **canister shields the missile from harsh weather conditions (rain, dust, extreme temperatures), maintaining its integrity.**
  - **Transport:** It safeguards the missile during transportation over rough terrain, minimizing damage risk.
1. **Simplified Logistics:**
    - **Ready-to-Launch:** The missile is factory-sealed, minimizing pre-launch checks and preparations.
    - **Quick Deployment:** Canistered missiles can be rapidly transported and launched from various locations, enhancing their strategic value.
  2. **Extended Shelf-Life:**
    - The controlled environment within the canister reduces wear and tear on the missile, preserving its operational capabilities for longer periods.
  3. **Launch Flexibility:**
    - **Mobile Launchers:** The canister allows the missile to be mounted on mobile launch vehicles (trucks), enhancing its deployment flexibility and survivability.
    - **Cold-Launch System** The canister enables a "cold-launch" mechanism, where the missile is ejected from the canister using pressurized gas

before its main engine ignites. This reduces stress on the launch platform.	
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- India's successful development of Multiple Independently Targetable Re-entry Vehicle (MIRV) technology on Agni-V is a significant advancement in its nuclear weapons program.
- MIRV allows a single missile to carry multiple warheads to different targets, **enhancing India's second strike capability.**
- India's nuclear doctrine, based on a **no-first-use policy and credible minimum deterrence**, emphasizes **massive retaliation in case of a first strike.**
- **Agni-V's MIRV capability is focused on countering potential missile defenses, particularly against China.**
- **India achieved nuclear triad status in 2018 with the deployment of INS Arihant, its first nuclear-powered ballistic missile submarine.**
- It is likely that MIRV technology will be deployed on **submarine-launched ballistic missiles in the future.**
- **China and Pakistan have also developed MIRV technology, leading to concerns about escalation dynamics and an arms race in the region.**
- **This technological competition is expected to become more intense, technology-intensive, and costly over time.**

# Three is a crowd: On Tamil Nadu political scene and the general election 2024

The DMK alliance has gained strength, but the opposition is split in T.N.

March 22, 2024 12:10 am | Updated 01:16 am IST

- Tamil Nadu's political landscape in 2024 shows a three-cornered contest.
- The ruling DMK-led front remains cohesive, with the DMK retaining all its allies.
- The BJP-led National Democratic Alliance (NDA) has expanded by including the PMK party.
- The AIADMK, on the other hand, is left with smaller organizations.
- In the upcoming elections, the DMK will contest in 22 out of 39 seats in the state.
- The Kongunadu Makkal Desiya Katchi will contest under the **DMK's 'rising sun' symbol.**
- The Congress retains 10 seats, including Puducherry, while the Left parties have two each.
- **The MNM, led by Kamal Haasan, has joined the DMK's coalition** but hasn't been allotted any constituencies. However, they've been assured a Rajya Sabha seat.
- Kamal Haasan's decision to align with the DMK reflects the recognition of the importance of having support from one of the principal Dravidian parties for political viability.

- The AIADMK, apart from the DMDK, lacks significant allies to bolster its voter base.
- Six months ago, the AIADMK exited the NDA due to disagreements with the BJP's State leadership, particularly **K. Annamalai, who criticized former Chief Ministers C.N. Annadurai and Jayalalithaa.**
- Despite reports suggesting the BJP's national leadership is inclined to collaborate with the AIADMK, Edappadi K. Palaniswami, the AIADMK's general secretary, is resolute in not forming an alliance with the BJP.
- Consequently, parties like the TMC (Moopanar) and the PMK, which were with the AIADMK in 2019, have leaned towards the BJP, possibly seeing the advantage of aligning with a national party.
- Breakaway groups from the AIADMK, led by O. Panneerselvam, and T.T.V. Dhinakaran's AMMK, are now part of the NDA.
- Despite Palaniswami's announcement of forming a "mega alliance," there hasn't been any significant shift from the DMK-led front.
- It's uncertain whether Palaniswami's attempts to appeal to religious minorities will have an impact, given that they are typically seen as supporters of the DMK.
- The **BJP's aggressive campaigning and visits by senior leaders, including Narendra Modi, have boosted the party's visibility,** but it's unclear if this will translate into votes or significant seat wins.
- The AIADMK remains the primary opposition party, but there's no indication yet that the election results will differ dramatically from those in 2019, despite potential anti-incumbency factors faced by the DMK.

# Should judges accept official posts after retirement?

(GS Paper II: Judicial Independence)

**“If a judge accepts a post-retirement appointment from the government, people are bound to doubt whether their judgments were delivered for extraneous reasons”**

Prime Minister Narendra Modi being greets former judge Abhijit Gangopadhyay during a public meeting in Siliguri, West Bengal. | Photo Credit: PTI



Prime Minister Narendra Modi being greets former judge Abhijit Gangopadhyay during a public meeting in Siliguri, West Bengal. | Photo Credit: PTI

- Judge Abhijit Gangopadhyay resigned from the Calcutta High Court and announced joining the BJP, sparking concerns about judicial impropriety.
- Some people believe judges should not hold official posts after retirement to maintain judicial independence.
- Others argue that certain posts may require individuals of high integrity, and there's no constitutional prohibition against judges taking such positions.

### **Should Justice Abhijit Gangopadhyay's decision to resign and join the BJP be considered a breach of judicial conduct by the Supreme Court? If yes, is it time for judicial reforms to expressly prohibit judges of Constitution courts from joining official posts?**

- Justice Deepak Gupta suggests that while **there's no legal barrier, the Supreme Court should restate the values expected from judges and outline norms for post-retirement conduct.**
- The **Bangalore Principles of Judicial Conduct (2002)** needs to be worked out again. The manner in which the judge resigned and joined a political party doesn't speak well of judicial independence.
- Sanjay Hedge acknowledges that judges may be **uniquely qualified for certain official roles post-retirement** but criticizes the timing of Gangopadhyay's resignation, implying it was to contest elections.
- Hedge suggests the **judiciary should reiterate its values and possibly require fresh entrants to pledge not to join active politics for a cooling-off period of two or three years.**

#### **Bangalore Principles of Judicial Conduct**

- It is a set of non-binding guidelines for ethical conduct of judges, drafted by a group of international legal experts in Bangalore, India (2002).
- Endorsed by the United Nations Commission on Human Rights in 2003.
- While not legally binding in India, they serve as a persuasive reference point for judicial conduct and behavior.

#### **Key Principles:**

- **Six Core Values:**

- Independence
- Impartiality
- Integrity
- Propriety
- Equality
- Competence and Diligence
- **Focus Areas:**
  - Judges should be free from political or personal influences.
  - Decisions must be based solely on the law and evidence presented.
  - Judges must maintain high moral standards and avoid conflicts of interest.
  - Judicial conduct should uphold public trust and confidence in the judiciary.
  - Equal treatment for all parties appearing before the court.
  - Judges must possess the necessary knowledge and skills to perform their duties effectively.

### **The Law Commission has also recommended a cooling-off period previously. If it were to be implemented, how long should it be for?**

- The Law Commission has recommended implementing a cooling-off period for judges after retirement.
- Sanjay Hedge suggests that a cooling-off period of at least two years should be enforced. This period allows judges to have an active career after retirement.
- Justice Deepak Gupta opposes post-retirement appointments for judges, citing concerns about public perception. He believes that accepting such appointments could raise doubts about the integrity of pre-retirement judgments.
- Ordinary citizens are frequently up against the state, which is the largest litigant in India. If a judge accepts a post-retirement appointment from the government, they are bound to doubt whether their judgments were delivered for extraneous reasons.
- In his minority judgment in Roger Mathews v. South Indian Bank Ltd (2019), Justice Deepak Gupta expressed his stance against post-retirement appointments for judges. He argued that, "One cannot expect justice from those who, on the verge of retirement, through the corridors of power looking for post-retirement sinecures."

### **Do you believe that judges who decide salient cases in favour of the government are more likely to secure post-retirement benefits? If so, does the remedy lie in the enactment of Central legislation since the Supreme Court has shown reluctance in the past to frame guidelines?**

#### **Justice Deepak Gupta's View:**

- Believes the government won't enact any law to address this issue.
- Thinks any competent lawyer can perform the tasks reserved for retired judges.
- Emphasizes the importance of integrity and caliber in individuals holding such positions.

#### **Sanjay Hedge's View:**

- Acknowledges the public perception that judges anticipating benefits post-retirement may favor those who can help them.

- Suggests that the judiciary should have the power to appoint or recommend appointments.
- Proposes a fair and transparent method of allotment controlled by the judiciary, where the Chief Justice is informed of upcoming vacancies, and the next available judge is assigned the post.

Increasing the age of superannuation of judges is often pitched as a solution for curbing such a practice. Some experts even say that India should follow the U.S. precedent of granting Supreme Court justices lifetime tenures. Do you concur with these proposals?

- **Increasing Retirement Age as a Solution:**
  - This could potentially disadvantage a generation of lawyers expecting judicial appointments.
  - Longer life expectancy and better healthcare may justify allowing well-performing judges to continue beyond the current retirement age.
- **Comparison with U.S. Precedent:**
  - The U.S. is reconsidering lifetime appointments for Supreme Court justices.
  - Lifetime appointments there aim to allow judges to shape the law for decades.
  - Implementing such a system in India could burden the institution and hinder the entry of fresh talent.
- **Justice Deepak Gupta's View:**
  - Agrees that increasing retirement age can be risky as mental and physical faculties may decline over time.
  - Advocates for a higher retirement age but suggests it should be uniform for High Court and Supreme Court judges.
  - The senior judges of the Supreme Court exercise a rather unholy hold over senior judges of the High Courts only because retirement ages are different. According to the constitutional scheme, Chief Justices of High Courts are equal to Supreme Court judges, but that is not the case in reality.

Statutes regulating tribunals and commissions often provide for the chairmanship of retired judges of the higher judiciary making them indispensable to these appointments. Is a common service or written test to secure such appointments a plausible alternative?

- **Proposed Alternative:**
  - Sanjay Hedge doubts the effectiveness of written tests for individuals at an older age.
  - He warns against the risk of creating judicial bureaucrats rather than independent decision-makers.
- **Justice Deepak Gupta's View:**

- There should be different types of tribunal services. For instance, a tax administrative service for tax matters and a service tribunal service for the Central Administrative Tribunal (CAT) and State Administrative Tribunals (SAT).
- Young people can be taken in for these services and then they can go up the ladder and head these institutions.
- Why should there be lateral appointments from the High Courts or the Supreme Court to head these bodies?

## **Justice Gupta, should post-retirement monetary perks such as pension be increased to reduce the reliance of judges on these appointments?**

- **Justice Deepak Gupta:**
  - When you join the service as a judge, you know what you are going to get after retirement. I am not sure that people want post-retirement jobs for money.
  - They want it for the power that comes with it.
  - If you are competent enough, you can get sufficient work as an arbitrator or a legal advisor after retirement.

# **Nuclear energy: fixing the finance | Explained**

(GS Paper III: Energy)

**Why is there an urgent need to reassess nuclear financing policies in Multilateral Development Banks to accommodate private capital or blended financing models for the generation of nuclear energy? Why is the state of nuclear infrastructure development and finance mobilisation not proportional? Where does India stand?**

March 21, 2024 10:25 pm | Updated 10:25 pm IST

[SYED ALI](#)

On March 21, Brussels hosted the first-ever Nuclear Energy Summit, co-chaired by the Prime Minister of Belgium Alexander De Croo and the Director General of the International Atomic Energy Agency (IAEA) Rafael Mariano Grossi.

Several world leaders joined the summit to highlight the role of nuclear energy in addressing climate change.

### **How did this come about?**

- The UN Climate Change Conference (COP28) in Dubai (UAE) in December 2023 stated the indispensable role of nuclear energy to meet climate goals.

- The declaration signed by 22 world leaders mentioned the **need to triple nuclear energy capacity by 2050**.
- The Nuclear Energy Summit, an initiative in collaboration with the IAEA's **'Atoms4Netzero' programme**, is part of the multilateral approach to decarbonisation.
- **Nuclear power emits four times less carbon than solar farms or other renewable sources such as wind, hydropower, and geothermal.**
- Most importantly, **nuclear power has the capacity to supply uninterrupted energy irrespective of geographical constraints** making it a crucial component of the wider renewable energy mix.
- Nuclear power plants (NPP) also have **low operating costs, smaller land imprint and a longer life cycle** compared to all the other renewable energy sources.

#### How can nuclear energy be financed?

- Two key motives for the large-scale adoption of nuclear power as the base load energy source are technology and finance.
- Recent developments in nuclear technology including **Small Modular Reactors (SMR), radiation proofing in existing plants, and extended fuel cycles**, have the potential to substantially mitigate nuclear-related risks.
- Signifying the **destigmatisation of nuclear energy** is the entry of technology startups in an otherwise government-run industry.
- The **role of technical advancements in reducing carbon emissions** is highlighted by an IAEA study, which predicts that while existing technologies will play a significant role, by 2050, half of carbon reductions will come from technologies currently in the **prototype stage**.
- However, in spite of technical advancements, **Multilateral Development Banks (MDBs)** and private investors have not made any significant contribution to the industry.
- The World Bank has not provided financing for a nuclear project since its \$40 million loan to Italy in 1959.
- There is a **pressing need to reassess nuclear financing policies of MDBS** to accommodate private capital or blended finance models.

#### Small Modular Reactors (SMRs)

- Small modular reactors are much smaller than traditional nuclear power plants and produce up to 300 MW(e) per unit. Their compact size and modular design allow factory fabrication and easier transportation.
- **Benefits:**
  - **Scalability:** SMRs can be deployed incrementally, adding units as energy demand increases.
  - **Flexibility:** Suitable for locations where large reactors may not fit. They can be used for grid power, off-grid applications, and process heat for industries.
  - **Potential Cost Savings:** Factory production could streamline construction and reduce costs.
- **Development:** More than 80 designs worldwide are in various stages. Some are near-term deployable.

#### Radiation Proofing in Existing Plants

- **Concept:** Radiation proofing (or shielding) involves using materials that block ionizing radiation, protecting workers and the surrounding environment.
- **Materials:**
  - **Concrete:** Common in reactor buildings due to its density and shielding ability.
  - **Lead:** Used for smaller, targeted shielding applications.

- **Water:** Excellent shielding material, often used in spent fuel pools.
- **Design Considerations:**
  - **Radiation type:** Shielding is designed for specific particle types (alpha, beta, gamma, neutron)
  - **Radiation intensity:** The expected dose rate determines shielding thickness.
  - **Maintenance and Inspection:** Shielding designs allow for necessary inspection and maintenance access.

#### Extended Fuel Cycles

- Extending the period a fuel assembly operates within a nuclear reactor before replacement. This improves fuel efficiency and reduces waste.
- **Strategies:**
  - **Higher Enrichment:** Using fuel with slightly higher uranium-235 content allows longer operation.
  - **Burnable Absorbers:** Materials added to fuel that initially suppress fission reactions, gradually "burn" away, allowing for sustained reactivity.
  - **Advanced Fuel Materials:** More robust fuel materials can withstand higher levels of radiation and last longer.
- **Benefits:**
  - **Reduced Waste:** Fewer spent fuel assemblies produced.
  - **Economics:** Less frequent refueling minimizes downtime and waste management costs.
- **Challenges:**
  - **Licensing:** Regulatory frameworks may need updates to accommodate extended cycles.
  - **Fuel Performance:** Fuel must maintain stability and integrity over the longer period.

#### Has the cooperative model worked?

- There are **successful financial practices** that can be replicated, for instance the **cooperative funding models of France, South Korea, Russia, and the U.K.** where a group of investors raise credit from the market and take full responsibility for project delivery.
- **In Finland, large power plants have been funded by multiple private companies** since the 1970s using a **cooperative finance model called 'Mankala'**.
- Under this model, **companies jointly own energy producers and share the costs of building and operating plants.**
- **They don't pay dividends but can buy the energy at a cost based on their ownership share,** with investors being wholesalers, retailers, or large industrial firms.
- **Financial creativity and market support with low interest rates** can unravel the potential of nuclear energy at scale.
- There are **440 nuclear reactors in the world, accounting for a quarter of the world's low-carbon energy.**
- The number of nuclear reactors is increasing, with 60 reactors under construction and 110 in the planning stage, most being in Asia, particularly China, which is soon to overtake the U.S. and the nuclear giant France.
- **China has set a target to produce 10% of its electricity from nuclear energy by 2035 and 18% by 2060.**
- However, the state of nuclear infrastructure development and finance mobilisation is not proportional.

- **NuScale Power, previously expected to be the first U.S. company licensed to build a 462MW SMR** in Utah, terminated its planned project due to rising costs.
- Nuclear powerhouses Westinghouse and Areva also filed bankruptcy due to project overruns.

#### What about India?

- **India's first commercial NPP in Pahalgah, Tarapur** offers reliable energy at 2/kWh lower than solar power tariffs.
- At Kudankulam, Tamil Nadu, a newer power plant offers electricity in the range of 4-6/kWh comparable to coal-fired thermal power plants.
- Despite its versatile nature, **nuclear power contributes only 1.6% of the total renewable energy mix in India.**
- **Stigma, weaponisation risk, radiation leak, regulation, high upfront cost, and long project overruns are the reasons for low adoption rate of nuclear energy.**
- Recently, the nuclear industry has been undergoing novel liberalisation, with ambitious plans for growth in India and abroad. Beginning with the invitation of \$26 billion in private investments, **a phase-wise tripling of nuclear capacity from 7,480 MW to 22,480 MW by 2031-2032**, and **Prime Minister Modi's attendance at the core loading of the Prototype Fast Breeder Reactor (PFBR) all mark a positive future** for the industry.
- The **PFBR's ability to generate fuel and power at the same time** represents a significant advancement in India's mostly self-reliant nuclear industry.

## Why did Pakistan carry out airstrikes in Afghanistan?

(GS Paper II: IR)

- **Recent Conflict Escalation:**
  - **Pakistani fighters conducted airstrikes in Afghan provinces of Paktika and Khost**, resulting in eight civilian casualties.
  - **In retaliation, the Taliban attacked Pakistani military posts** along the border using heavy weapons.
  - The incident underscores the growing tension between Pakistan and Afghanistan.
- **Reasons for Souring Relationship:**
  - Dispute over **Durand Line**: The **2,670-kilometre Durand Line**, the international border between Pakistan and Afghanistan, has been contested by successive Afghan governments.
  - The **Taliban**, upon returning to power in 2021, firmly **rejected the Durand Line as a permanent border**, exacerbating **ethnic Pashtun divisions**.
  - Skirmishes between Pakistani and Afghan forces along the border escalated following the Taliban's rejection of the Durand Line.
- **Impact of TTP Ceasefire and Resurgence:**
  - The Tehreek-e-Taliban Pakistan (TTP) called off a ceasefire in November 2022 after failed talks brokered by the Afghan Taliban.

- Surge in Terror Incidents: The TTP's nationwide attacks after the ceasefire resulted in a significant increase in terror incidents across Pakistan in 2023.
- Pakistan urged the Afghan Taliban to control the TTP, leading to distrust due to the surge in attacks originating from Afghan soil.
- **Trigger for Airstrikes:**
  - Seven Pakistani soldiers were killed in a suicide bombing in **North Waziristan** on March 16.
  - President Asif Ali Zardari vowed a strong response during the funeral prayers for the soldiers.
  - The Taliban accused Pakistani planes of bombing Barmal district in Paktika province and Sepera district in Khost on March 18, resulting in civilian casualties.
- **Pakistani Response:**
  - Pakistan confirmed airstrikes targeting rebels belonging to the TTP's Hafiz Gul Bahadur Group in retaliation for the March 16 attack.
  - Conveyed Concerns: Pakistan expressed serious concerns to the Afghan government over the presence of terror outfits, including the TTP, inside Afghanistan, posing a threat to Pakistan's security.
- **Previous Airstrikes:**
  - Pakistan previously conducted airstrikes in Khost and Kunar provinces in April 2022.
- **Taliban's Warning and Response:**
  - The Taliban warned Pakistan of severe consequences if attacks continue inside its territory, claiming civilian casualties in the airstrikes.
  - **Denial and Acknowledgment:** The Taliban denied sheltering thousands of TTP militants but acknowledged the possibility due to Afghanistan's rugged terrain.

## March flash PMI signals a sharp rise in output, new orders and hiring

### (GS Paper III: Manufacture Sector)

- **Manufacturing Sector Performance:**
  - March's manufacturing sector output hit a 42-month high, reaching a Flash PMI of 59.2 compared to February's 56.9.
  - New orders in the manufacturing sector quickened, indicating robust demand.

#### Purchasing Managers' Index (PMI)

- The PMI is a key economic indicator that measures the health of the manufacturing and service sectors within a country. It provides insights into current market conditions and economic trends.
- **Compilation:** PMIs are **compiled from monthly surveys** sent to senior executives at private sector companies. These executives provide input on changes in key business variables compared to the previous month.
- **Calculation:** PMI is a diffusion index based on five sub-indices:

- **New Orders**
- **Output**
- **Employment**
- **Suppliers' Delivery Times**
- **Stock of Purchases**

#### **Interpretation of PMI**

- **Above 50:** A PMI reading above 50 indicates an expansion of the sector compared to the previous month.
- **Below 50:** A PMI reading below 50 signals a contraction.
- **50:** A reading of 50 indicates no change in the sector's activity.

#### **Importance of PMI**

- **Decision-makers:** Companies use PMI data to shape business strategies, production plans, and investment decisions.
- **Investors:** Analysts and investors watch PMI figures as an indicator of future economic activity and market performance.
- **Central banks:** PMI data can influence monetary policy decisions.

- **Services Sector Performance:**
  - Services sector activity slightly moderated in March, with the Services PMI easing from 60.6 in February to 60.3.
  - However, new orders in the services sector accelerated, showing continued growth.
- **Export Orders and Backlogs:**
  - Overall export orders rose to nearly a two-year high, indicating improved international demand.
  - Work backlogs increased, especially for services providers, leading to an uptick in hiring activity at the fastest pace in six months.
- **Input Costs and Output Prices:**
  - Input costs rose for both manufacturing and services firms, driven by higher prices of commodities like metals, plastic, transportation, labor, and food.
  - Services firms were able to raise output prices in line with input costs, mitigating margin squeeze faced by manufacturers.

## **RBI finalises framework for SROs in regulated entities**

- **Introduction of Omnibus Framework:**
  - The Reserve Bank of India (RBI) has finalized an **Omnibus Framework for recognizing Self-Regulatory Organizations (SRO) for its Regulated Entities (REs)**.

**Regulated Entities** refer to the various financial institutions and companies that fall under the regulatory purview of the Reserve Bank of India.

- Each sector of regulated entities, including fintechs, will have separate SROs.

- The framework allows the RBI to receive applications from various entities seeking SRO status.
- **Need for Better Industry Standards:**
  - With the increasing number and scale of operations of Regulated Entities (REs), along with the adoption of innovative technologies and expanded customer outreach, there's a need for better industry standards for self-regulation.
- **Contents of the Omnibus Framework:**
  - **The framework outlines broad parameters such as objectives, responsibilities, eligibility criteria, governance standards, application process, and other basic conditions for granting recognition.**
  - These parameters will be common for any SRO proposed to be recognized by the RBI.
- **Sector-Specific Guidelines:**
  - Sector-specific guidelines, including the number of SROs and membership criteria, will be issued separately by the respective departments of the RBI wherever a sectoral SRO is intended to be set up.
- **Expectations from SROs:**
  - An SRO is expected to operate with credibility, objectivity, and responsibility under the oversight of the regulator.
  - The primary goal is to improve regulatory compliance for the healthy and sustainable development of the sector it serves.

#### **PRELIMS PRACTICE QUESTION:**

**Question 1:** Consider the following water-related schemes/programs in India:

1. Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)
2. National Aquifer Mapping and Management Program (NAQUIM)
3. Mission Amrit Sarovar

How many of the above come under the Ministry of Jal Shakti?

- a. Only one
- b. Only two
- c. All the three
- d. None

**Question 2:** Which of the following is a key focus area of the 'Per Drop More Crop' component under PMKSY?

- a. Construction of check dams and farm ponds
- b. Expansion of irrigation canals
- c. Promotion of micro-irrigation techniques
- d. Soil and water testing for crop suitability

**Question 3:** The Jal Shakti Abhiyan campaign lays primary emphasis on:

- a. Water conservation and rainwater harvesting
- b. Fluoride removal from drinking water sources
- c. Cleaning of polluted rivers and lakes
- d. Interstate water dispute resolution

**Question 4:** Which of the following statements is/are true about the PMKSY – Watershed Development component?

- 1. Implemented by the Ministry of Rural Development.
- 2. Focuses on groundwater recharge and restoration of ecological balance.

Select the answer using the code given below:

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

**Question 5:** Consider the following pairs of schemes/programs with their primary focus areas.

	Schemes/Programs	Focus Areas
1	Mission Amrit Sarovar	Soil and water conservation in rainfed areas
2	Watershed Management	Sustainable irrigation practices
3	PMKSY	Rejuvenation of water bodies

How many of the above pair(s) is/are correctly matched

- a. Only one
- b. Only two
- c. All the three
- d. None

**Question 6:** Consider the following parameters:

- 1. Output
- 2. New Orders
- 3. Suppliers' Delivery Times
- 4. Consumer Confidence

How many of above factors is/are part(s) of the Purchasing Managers' Index (PMI) calculation?

- a. Only one

- b. Only two
- c. Only three
- d. All the four

**Question 7:** Consider the following statements about the Purchasing Managers' Index (PMI):

- 1. A PMI reading consistently below 50 is an indicator of potential economic recession.
- 2. PMI data is useful for policymakers in formulating monetary and fiscal policies.

Which of the above statements given above is/are correct?

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