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**Daily News
Analysis**



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1. Masala Bond

- **Prelims** - Masala Bond
- **Mains** - GS 3 - Economy (Capital Market Instruments)

Why in the news?

- The Enforcement Directorate issued a notice to Kerala CM as a part of the KIIFB Masala Bond investigation.

Masala Bond

- **What is it?:** These are the **Rupee-denominated bonds issued outside India** by Indian entities.
- **Features:**
 - They are **debt instruments** that allow raising money in **local currency (INR)** from foreign investors.
 - **Currency risk lies with the investor**, not the issuer- Protecting domestic companies from exchange-rate volatility.
 - Bonds generally offer **attractive interest rates** to compensate investors for exchange-rate risk.
 - **Both government and private entities** can issue Masala Bonds.
- **Who can Invest:**
 - **Investors outside India** who are interested in Indian assets.
 - Any resident of a country that is a Financial Action Task Force (FATF) member can subscribe.
 - Also open to **multilateral and regional financial institutions** of which India is a member.
 - Eligible investors include **Individuals, Institutions as well as Financial organisations** following international standards.
- **Permitted and Restricted Uses:**

Permitted uses	Restricted Use
Affordable housing	Buying land
Infrastructure projects	Investing in the stock market
Refinancing rupee loans	Funding real estate projects
Corporate working capital requirements	

2. Bioremediation

- **Prelims** - Bioremediation
- **Mains** - GS 3 - Environment (Pollution) & S and T (Biotechnology)

Why in the news?

- Unchecked waste disposal and pollution have forced India to take urgent action by using modern technologies like bioremediation to manage and reduce waste.

Bioremediation

- **What is it?:** It is a process involving **naturally occurring or engineered microorganisms, bacteria, fungi, algae, or plants** used to break down dangerous pollutants into harmless by-products.
- **Types:**
 - **In Situ Bioremediation:** Treatment occurs directly at the contaminated site. e.g.: Oil-eating bacteria used over ocean spills.
 - **Ex Situ Bioremediation:** Contaminated soil or water is removed, treated in a facility, and returned.
- **Need for Bioremediation in India:**
 - Heavily polluted rivers (Ganga, Yamuna), Untreated sewage, and Toxic effluents, Oil leaks, Pesticide residues, **Heavy metal contamination (Ganga)**
 - Traditional clean-up methods (thermal, chemical, mechanical) are costly, energy intensive and may lead to secondary pollution.
- **Indian Progress in Bioremediation:**
 - **Department of Biotechnology (DBT)** Encourages academia–industry partnerships and supports projects through the **Clean Technology Programme**.
 - **CSIR–NEERI** has a mandate to develop & implement bioremediation programmes nationwide.
 - **Start-ups** offer microbial formulations for wastewater and soil cleaning fostering commercial adoption.
 - **Research Innovations:**
 - ★ IIT researchers developed a **cotton-based nanocomposite** to clean oil spills.

>> Kozhikode >> Ernakulam >> Thiruvananthapuram

★ Scientists have identified **bacteria capable of degrading soil pollutants.**

- **Challenges:**

- No unified national standards for bioremediation
- Risks arise especially with genetically modified organisms (GMOs).
- Weak biosafety guidelines and Limited trained personnel

- **Way Forward:**

- Establish a **National standard and protocol** for Bioremediation practices.
- **Promote R&D** in Bioremediation and Microbial banks
- **Integration** with Urban waste management as well as Industrial Effluent treatment plants.
- Strengthen regulatory approvals for startups and **incentivise Local Bodies** for their adoption.

3. Small Modular Reactors (SMRs)

- **Prelims** - Small Modular Reactors
- **Mains** - GS 3 - S&T (Indigenisation of technology) & Economy (Energy)

Why in the news?

- Russia's state-owned nuclear corporation, Rosatom, strongly advocates the deployment of its SMRs in India.

Small Modular Reactors (SMR)

- **What is it?:** SMRs are **compact nuclear reactors** with a **capacity of 10-300 MW**, designed to complement conventional Nuclear Power Plants (NPPs).
- **Advantages:**
 - SMR features **enhanced safety measures, simpler design, and passive safety features** - reduced chance for uncontrolled release and accidents.
 - **SMR can be installed in decommissioned thermal power plants.**
 - SMR minimizes time and cost for installation.
 - SMR can **generate clean and reliable energy by minimizing greenhouse gas emissions** for industries and urban areas.
 - **Most SMRs need only low-enriched uranium.**
- **Issues:**
 - Establishing an efficient regulatory framework.
 - Public attitude towards nuclear installation due to various nuclear accidents.
 - Initial capital investment is very high.
- **India's Engagement with SMRs:**
 - India is exploring SMRs as part of its clean energy transition and foreign policy pitch in the nuclear domain.
 - The Department of Atomic Energy (DAE) is in talks with Holtec International (USA) for collaborative ventures, including the deployment of Holtec's SMR-300 at coal plant sites in India.
 - **Focus areas include:**
 - ★ Joint manufacturing of nuclear components.
 - ★ Transitioning to light water reactor technology, aligning with global standards.

- **Advantages and Challenges of SMR for India:**

→ **Advantages:**

- ★ Experience with small reactors like 220 MWe PHWRs.
- ★ Cost-efficient manufacturing capabilities.
- ★ Track record of safely operating reactors over decades.

→ **Challenges:**

- ★ India's reliance on heavy water reactor technology, which is outdated compared to globally dominant light water reactors.
- ★ **Legal barriers** like the Civil Liability for Nuclear Damage Act, 2010, which holds suppliers liable for nuclear accidents, discouraging foreign investment.

- **Way Forward**

- Establish a clear **SMR policy framework** defining licensing norms, safety guidelines as well as siting guidelines.
- Promote **indigenous technology development** in the region of SMR and allied technologies
- International Cooperation and **Technology import**.
- Enable **Private as well as PPP models** in implementation.

4. Exercise Garuda Shakti - 2025

- **Prelims** - Exercise Garuda Shakti 2025
- **Mains** - GS 2 - International Relations (Joint Defence Operations)

Why in the news?

- The **10th edition** of Exercise Garuda Shakti began in **Himachal Pradesh**.

Exercise Garuda Shakti - 2025

- **What is it?:** It is a **bilateral** military exercise between **India and Indonesia**.
- **Objectives:**
 - The exercise aims to strengthen mutual understanding, cooperation and interoperability between the **Special Forces** of the two nations.
 - Its scope includes troop-level tactics, techniques and procedures in a counter-terrorism environment, covering unarmed combat techniques, combat shooting, sniping, heliborne operations and planning for drone, counter-UAS and loiter-munition strikes in semi-mountainous terrain.
 - The training also features the exchange of expertise and information on weapons, equipment and operational practices.

Other Exercises Between India and Indonesia:

- **Samudra Shakti:** A bilateral **maritime exercise**.
- **IND-INDO CORPAT:** A joint patrol to enhance cooperation in the maritime domain.

5. Prelims Pointers

- **Large Exposures Framework (LEF):**

- It is a regulation initiative by the **Reserve Bank of India (RBI)**
- It sets limits on how much banks and NBFCs can lend to one borrower or a group of related borrowers, so that risks are spread out and they don't suffer big losses if those borrowers fail to repay.
- It aligns Indian norms with Basel Committee on Banking Supervision (BCBS) standards.

- **Mahad Satyagraha (1927):**

- **Leader:** Led by **Dr. B. R. Ambedkar**
- **Aim:** India's first organized Dalit civil rights movement asserting the **right of untouchables to access public water resources** denied due to caste discrimination