Mains Topics

Significance of a Strong Defence Industrial Base

Context

India's defence manufacturing ecosystem is undergoing a structural transformation, marked by greater private-sector participation, higher domestic production, and rapidly expanding defence exports, positioning the country to strengthen self-reliance and emerge as a credible global defence supplier.

Current Status Of Defence Production in India

- **Highest-ever defence production:** ₹1.54 lakh crore in FY 2024–25.
- **Indigenous defence production:** ₹1,27,434 crore in FY 2023–24 (up 174% from 2014–15).
- **Defence exports:** Record ₹23,622 crore in FY 2024–25, to 80+ countries / over 100 nations.
- **Ecosystem depth:** 16,000 MSMEs, 788 industrial licences to 462 companies.
- **Private sector role rising:** About 23% share in total production (FY 2024–25).

Significance of a strong defence industrial base

- **Strategic autonomy:** Reduces dependence on imports and insulates national security from global supply-chain disruptions.
- **Operational readiness:** Ensures timely availability of equipment during conflicts and crises.
- **Economic gains:** Generates high-skilled employment, boosts manufacturing value chains, and supports innovation.
- **Export capability:** Enhances India's role in global defence markets amid rising international demand for cost-effective platforms.
- **Geopolitical leverage:** Signals technological maturity and reliability, strengthening diplomatic and strategic partnerships.
- **Resilience:** Nations with robust domestic defence industries demonstrate greater stability in volatile security environments.

Key issues and challenges

- **Regulatory complexity:** Lengthy procedures for export licensing, joint ventures, and technology transfer, particularly affecting MSMEs and startups.
- **Policy uncertainty:** Limited long-term demand visibility dampens private investment confidence.
- **Institutional fragmentation:** Overlapping roles across ministries hinder coordination and export facilitation.
- **DRDO transition needs:** Insufficient separation between frontier research and downstream production/commercialisation.
- **Financing constraints:** Limited access to competitive credit and specialised export financing instruments.
- **Testing and certification bottlenecks:** Stringent domestic standards, inadequate integrated testing facilities, and delayed trials.

- **E.g.,** Naval systems or aerospace components undergo repeated trials, extending timelines by years.

- **Ecosystem gaps:** Need for a dedicated export facilitation agency and international certification alignment to compete with established global players.

Way Forward

- **Simplify regulatory processes** through single-window digital clearances, time-bound approvals, and fast-track mechanisms for MSMEs and startups.
- **Provide long-term demand visibility** by publishing multi-decade defence acquisition and indigenisation roadmaps with assured order commitments.
- **Strengthen public–private partnerships** by clearly delineating roles, with DRDO focusing on frontier research and industry leading production and commercialisation.
- **Expand defence financing mechanisms**, including export credit, guarantees, and lines of credit for foreign buyers of Indian defence equipment.
- **Upgrade testing, trials, and certification systems** by expanding integrated facilities, adopting international standards, and enforcing strict timelines.
- **Focus on critical technology development** via co-development partnerships, IPR sharing, and sustained R&D funding in engines, electronics, and sensors.
- **Ensure policy stability and continuity** to build investor confidence and support India's defence export target of ₹50,000 crore by 2029.

Source: The Hindu

The Changing Patterns Of India's Student Migration

Context

India is witnessing a **sharp rise in outbound student migration**, increasingly driven by **self-financed education**, with over **13.35 lakh Indian students abroad in 2024** and numbers projected to rise further, raising concerns about **debt, underemployment, exploitation, and "brain waste"** rather than assured upward mobility.

Current trend of student migration for education

- Student migration is **no longer limited to elite universities or fully funded programmes**; it is largely **self-financed by middle-class households**.
- Indian students are spread across **70+ countries**, with **the U.S. and Canada accounting for ~40%**, followed by the U.K., Australia, and Germany.
- Growth is especially visible at the **State level**, e.g. **Kerala**, where student migration **doubled between 2018 and 2023**.
- Many students enrol in **lower-tier universities and vocational colleges**, often through **education agents** rather than merit-based pathways.
- Migration is increasingly tied not just to education but to **post-study work and permanent residency prospects**.

What are the major reasons for it?

- **Perceived gaps in domestic higher education quality and capacity**, especially for globally recognised degrees.
- **Limited availability of well-paid, secure jobs in India**, even for degree holders.
- **Aspirations for social mobility, global exposure, and permanent residency** in OECD countries.
- **Aggressive recruitment by overseas colleges and agents**, marketing foreign degrees as pathways to migration.
- **Cultural and social signalling**, where foreign education is seen as a marker of success and status.

What are the key challenges

- **Deskilling and underemployment:** In the UK, reports suggest **only 1 in 4 Indian postgraduates** secure a sponsored skilled work visa.
- **Debt and reverse remittances:** Families spend **₹40–50 lakh per student**, often via loans or mortgaging property.
    - Economists describe this as **reverse remittance**, where Indian households subsidise foreign economies.
- **Exploitation in labour markets:** Students work in **low-wage sectors** (care work, delivery, hospitality), often juggling multiple jobs.
    - Some exceed legal work limits, increasing vulnerability to exploitation.
- **Policy shocks in host countries:** UK's **2024 restrictions** ended the conversion of student visas into care visas, closing a key survival pathway.

- **Mental health stress:** Rising rents, limited work hours, visa uncertainty, and academic pressure contribute to anxiety and depression.

Way forward

- **Regulate education agents** through licensing, transparency norms, and penalties for malpractice.
- **Mandatory pre-departure counselling** on costs, visa rules, realistic job prospects, and institutional quality.
- **Bilateral agreements with host countries** to ensure accountability of foreign institutions and fair treatment of students.
- **Strengthen domestic higher education** by improving quality, global recognition, and industry linkage of Indian universities.
- **Expand skilled employment opportunities in India**, especially for graduates, to reduce migration driven by compulsion.
- **Create reliable data and early-warning systems** on exploitative colleges, visa risks, and employment outcomes.
- **Promote alternatives** such as high-quality offshore campuses in India and structured international exchange programmes.

Source: The Hindu

Today's Prelims Topics

Second WHO Global Summit on Traditional Medicine

Context

The second WHO Global Summit on Traditional Medicine was concluded in New Delhi.

Key Outcomes of 2nd WHO Global Summit on Traditional Medicine

- Introduction of the **My Ayush Integrated Services Portal (MAISP)** as a unified digital platform for Ayush services, research, and governance.
- Announcement of the **Ayush Mark**, envisaged as a **global quality benchmark** for Ayush products and services.
- Establishment of the **Traditional Medicine Global Library (TMGL)**, the world's **largest digital repository** on traditional, complementary, and integrative medicine.
- **Adoption of Delhi Declaration** which recognises traditional medicine as **shared biocultural heritage and aligned with WHO Global Traditional Medicine Strategy 2025–2034.**
- Declaration of new collaborations, including a **Centre of Excellence for BIMSTEC countries** and an **India–Japan partnership** in traditional medicine.

Source: Pib

Bureau of Port Security

Context

Centre to set up Bureau of Port Security for vessels, port facilities.

About Bureau of Port Security

- It is a proposed **statutory body** to be established under **Section 13 of the Merchant Shipping Act, 2025** and function under the **Ministry of Ports, Shipping and Waterways**.
- **Aim:** To strengthen the security of ships and port facilities across India.
- The Bureau will be headed by a **Director General of Indian Police Service rank**, with the **Director General of Shipping** acting as the head during the one-year transition period.
- **Key Functions:**
  - The Bureau will implement a **graded and risk-based security framework**, considering vulnerability, trade volume, and geographic location of ports.
  - It will oversee the **collection, analysis, and sharing of security-related information**, including threats from terrorism, smuggling, and sabotage.
  - A **dedicated cyber security division** will be created to protect port information technology systems from digital threats.
  - The **Central Industrial Security Force** has been designated to conduct security assessments and prepare security plans for port facilities.
  - The Force will also **train and certify private security agencies**, ensuring that only licensed agencies operate in port security.

Source: The Hindu

Risk-based deposit insurance for banks

Context

The Central Board of the RBI approved the risk-based deposit insurance premium framework which

will replace the current flat-rate system (of 12 paise per Rs 100 deposit).

What is Risk-based Deposit Insurance for Banks

- It is a system where the insurance fees (premiums) that banks pay to protect their depositors are determined by the bank's individual risk profile.
- **Key Objectives:**
  - **Reducing Moral Hazard:** When insurance is flat-rate, banks might take excessive risks because they know the insurance fund will cover them if they fail. RBP makes risk-taking expensive for the bank.
  - **Rewarding Prudence:** It financially rewards well-managed banks by lowering their operational costs.
  - **Fairness:** It ensures that riskier institutions—which are more likely to drain the insurance fund—contribute a larger share toward it.
- **How the Framework Works:**
  - **Risk Indicators:** Regulators look at metrics like **Capital Adequacy**, **Asset Quality** (non-performing loans), and **Management/Governance**.
  - **Grading**: Banks are often grouped into categories (e.g., "Well-Capitalized" vs. "Undercapitalized").
  - **Premium Calculation:** A "Well-Capitalized" bank with low risk pays a lower premium rate, while a "Risky" bank pays a higher rate—up to a specific ceiling.

Deposit Insurance and Credit Guarantee Corporation (DICGC)

It is a wholly-owned subsidiary of the Reserve Bank of India (RBI)—is the body responsible for protecting bank deposits.

Source: New Indian Express

Sponge-associated microbes in tackling metal pollution

Context

A recent study published in *Microbiology Spectrum* reports that **freshwater sponges from the Sundarban delta can act as bioindicators and bioremediators of toxic metal pollution**

About it

- Freshwater sponges (such as Spongilla alba and Ephydatia fluviatilis) do not work alone.
- They host a distinct community of bacteria that is significantly different from the surrounding water.
- This relationship forms a holobiont—a single ecological unit where the host and its microbes support each other's survival.
  - **Bioaccumulation:** Sponges act as "natural filters," pumping vast amounts of water and trapping toxic metals like **Arsenic (As), Lead (Pb), and Cadmium (Cd)** in their tissues at concentrations much higher than in the environment.
  - **Microbial "Shield":** While the sponge absorbs the metals, the associated bacteria provide the metabolic "machinery" to handle this toxicity, preventing the sponge from dying due to metal stress.

Source: PIB

Autophagy

Context

Researchers at Jawaharlal Nehru Centre for Advanced Scientific Research have identified the exocyst protein complex as a crucial missing link in early autophagosome formation, opening new possibilities to therapeutically target autophagy-related disorders such as Alzheimer's, Parkinson's, and cancer.

About Autophagy

- Autophagy is a regulated cellular process through which cells degrade and recycle damaged organelles, proteins, and pathogens to maintain cellular homeostasis.
- In 2016, the **Nobel Prize** in Physiology or Medicine was awarded to **Yoshinori Ohsumi** for his discoveries of the mechanisms for autophagy.
- **Mechanism:**
  - **Initiation:** Cellular stress or nutrient deprivation activates autophagy-related (ATG) proteins.
  - **Nucleation:** A membrane structure (phagophore) begins to form around the targeted cellular material.
  - **Elongation**: The phagophore expands and encloses the cargo, forming a double-membraned autophagosome.
  - **Fusion:** The autophagosome fuses with a lysosome to form an autolysosome.
  - **Degradation:** Lysosomal enzymes break down the contents, and the recycled molecules are reused by the cell.
- **Types:**
  - **Macroautophagy:** Bulk degradation of cytoplasmic components via autophagosome formation.
  - **Microautophagy:** Direct engulfment of cytoplasmic material by the lysosomal membrane.
  - **Chaperone-mediated autophagy:** Selective degradation of specific proteins transported directly into lysosomes via chaperone proteins.
- **Role:**
  - Maintains cellular quality control by removing damaged organelles and protein aggregates.
  - Ensures neuronal survival and function in long-lived cells.
  - Supports immune defense by eliminating intracellular pathogens.
  - Prevents early tumor development by preserving genomic stability but may support cancer progression at later stages.

Source: PIB

Coal Controller's Organisation

Context

The Ministry of Coal has simplified coal washery reject disposal rules by removing the requirement of prior permission from the Coal Controller Organisation for energy extraction and productive reuse.

About Coal Controller's Organisation

- **Establishment:** The Coal Controller Organisation was set up in **1972** under the **Ministry of Coal**, Government of India.
- **Legal basis:** It functions under the provisions of the **Colliery Control Order, 2000**, issued under the Essential Commodities Act.
- **Primary role:** CCO acts as the **statutory regulator of coal production, quality, supply, and distribution** in India.
  - **Coal quality oversight:** It monitors coal grading, sampling, and verification of **Gross Calorific Value (GCV)** to ensure quality compliance.
  - **Data and reporting:** Responsible for collection, compilation, and publication of coal-related statistics for policy and planning purposes.
  - **Regulatory functions:** Oversees pricing-related issues, resolves coal supply disputes, and enforces compliance with coal policies.

- **Environmental and operational oversight:** Plays a key role in approving and inspecting environmentally sensitive activities such as **disposal of coal washery rejects in mine voids or low-lying areas**.

Source: PIB

National Project for Strengthening Disaster Risk Reduction (NPSDRR)

Context

The Union Ministry of Panchayati Raj and the National Disaster Management Authority approved the National Project for strengthening Community-Based Disaster Risk Reduction Initiatives in Panchayati Raj Institutions.

About NPSDRR

- **Implementation:** Jointly implemented by the Ministry of Panchayati Raj and the National Disaster Management Authority.
- **Financial outlay:** Total allocation of ₹507.37 crore.
- **Coverage:** Implemented across 20 States and 81 disaster-prone districts, covering 20 Gram Panchayats in each district.
- **Cluster-based approach:** Gram Panchayats and Model Gram Panchayats are selected within geographically contiguous clusters.
- **Integrated planning:** Focuses on preparing Panchayat- and village-level Disaster Management Plans and integrating them with Gram Panchayat Development Plans (GPDPs).
- **Model Gram Panchayat concept:** One Model Gram Panchayat in each of the 20 States, mapped to six different hazard types.
- **Demonstration role:** Model Gram Panchayats act as replicable templates for embedding disaster resilience into local planning, infrastructure, and community preparedness.

Source: Newsonair