Today's Prelims Topics

M.S Swaminathan

Context

Prime Minister Narendra Modi will inaugurate a **science conference on August 7 to mark the birth centenary of M.S. Swaminathan**, organized by MSSRF.

About Dr. M.S. Swaminathan

- Full Name: **Mankombu Sambasivan Swaminathan**
- Known as: **Father of Green Revolution in India**
- Lifespan: **7th August 1925 – 28th September 2023** (Died at age 98)
- **Career:**
  - **IARI Director (1961–1972)** – spearheaded research on high-yielding wheat.
  - **Director-General, ICAR (1972–1979)**
  - **Secretary, Ministry of Agriculture & Irrigation (1979–1980)**
  - **Member, Planning Commission (1980–1982)** – focused on agriculture & rural development.
  - **Director-General, IRRI, Philippines (1982)**
  - **President, IUCN (1984–1990)**
  - Served as **Rajya Sabha MP (2007–2013)**
- **Major Contributions:**
  - Green Revolution in India
  - Chaired the **National Commission on Farmers**, recommended:
    - **MSP reforms**
    - Policies for **farmer suicide prevention**
    - **Protection of Plant Varieties and Farmers' Rights Act, 2001**
  - **Cryogenetics in potatoes** – developed cold-resistant crops.
  - Initiated research on **C4 rice plants** for improved photosynthesis efficiency.
- **Key Awards & Recognitions:**
  - **International:**
    - Ramon Magsaysay Award (1971)
    - Albert Einstein World Science Award (1986)
    - World Food Prize (1987)
    - UNEP Sasakawa Environment Prize (1994)
    - Franklin D Roosevelt Four Freedoms Medal (2000)
    - UNESCO Gandhi Prize (2000)
  - **National:**
    - Shanti Swarup Bhatnagar Award (1961)
    - Padma Shri (1967)
    - Padma Bhushan (1972)
    - Padma Vibhushan (1989)
    - Indira Gandhi Peace Prize (2000)
    - Lal Bahadur Shastri National Award (2007)

Source: TheHindu

Pradhan Mantri Kisan Sampada Yojana (PMKSY)

Context
The Union Cabinet increased the budget for **PMKSY** by ₹1,920 crore to ₹6,520 crore to strengthen the food processing sector through new irradiation units and food testing labs.

Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)
- Initially approved as a **Central Sector Scheme** named **SAMPADA (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters)**.
- Approved by the **Union Cabinet in May 2017** for the **14th Finance Commission cycle (2016–2020)**.
- The scheme has now been **renamed** as **Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)**.
- **Ministry**: Ministry of Food Processing Industries (MoFPI)
- It is a **comprehensive umbrella scheme** aimed at boosting the food processing sector in India.
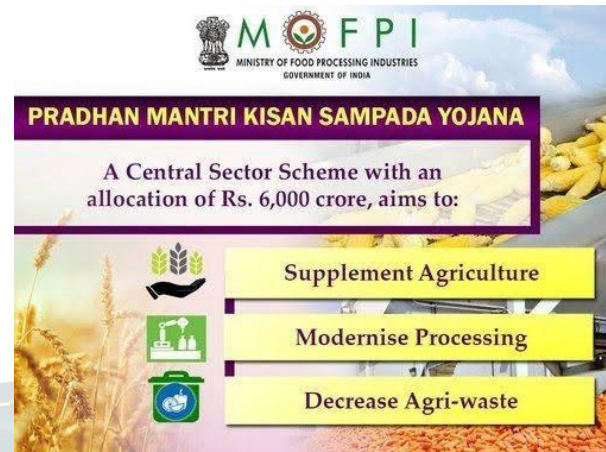
Objectives
- **Modernise infrastructure** in food processing
- **Reduce post-harvest losses**
- **Improve value addition** in agricultural produce
- **Boost farmer income**
- Create **modern supply chains** from farm gate to retail
- Ensure **better price realization** for farmers

Key Components / Sub-schemes
- **Mega Food Parks**
- **Integrated Cold Chain and Value Addition Infrastructure**
- **Food Safety and Quality Assurance Infrastructure**
- **Infrastructure for Agro-processing Clusters**
- **Backward & Forward Linkages**
- **Creation/Expansion of Food Processing and Preservation Capacities**
- **Operation Greens** – to stabilize supply of Tomato, Onion, Potato (TOP)

Recent Developments (2025)
- **Budget increased** by ₹1,920 crore → Total outlay now **₹6,520 crore**
- Funds to be used for:
  - **50 multi-product food irradiation units**
  - **100 food testing labs**

Benefits & Impact
- Reduces **agri-wastage**
- Increases **farm-level income**
- Enhances **food exports**
- Promotes **entrepreneurship** in rural areas
- Creates **employment** in food processing sector
- Improves **food safety and quality standards**

Source: TheHindu

Himgiri

Context

INS Himgiri (Yard 3022) has been officially handed over to the Indian Navy by **Garden Reach Shipbuilders and Engineers (GRSE)** in **Kolkata.**

About INS Himgiri

- **Type & Class**:
  - INS Himgiri is the **third ship** of the **Nilgiri-class (Project 17A)** frigates.
  - It is the **first ship of its class** constructed by **Garden Reach Shipbuilders & Engineers (GRSE), Kolkata**.
  - The current INS Himgiri is a **modern reincarnation** of the original **Leander-class frigate INS Himgiri**
- **Design & Supervision**:
  - **Designed by**: Warship Design Bureau (WDB).
  - **Construction overseen by**: Warship Overseeing Team (WOT), Kolkata.
- **Key Features of INS Himgiri**
  - **Advanced Weaponry & Sensors**: Equipped with a **state-of-the-art weapon and sensor suite**, offering upgrades over the earlier **Project 17 (Shivalik-class)**.
  - **Propulsion System**: Uses a **CODOG (Combined Diesel or Gas)** propulsion setup.
    - Powered by both **diesel engines** and **gas turbines**.
    - Drives **Controllable Pitch Propellers (CPP)** via an **Integrated Platform Management System (IPMS)**.
  - **Armament Includes**:
    - **Supersonic Surface-to-Surface Missiles (SSM)**
    - **Medium-Range Surface-to-Air Missiles (SAM)**
    - **Close-in Weapon Systems (CIWS)** with rapid-fire capability
  - **Indigenization**:
    - Boasts **75% indigenous content**.
    - Involved over **200 MSMEs** during construction at GRSE.

Source: PIB

Reorganisation of states

Context

Tamil Nadu Governor R N Ravi criticized the linguistic division of states, calling it a cause for creating "second-class citizens," sparking controversy amid renewed debates on language politics in India.

Reorganisation of States in India

- **Historical Background**:
  - Post-independence India required an efficient administrative setup.
  - The need arose to reorganise states for **better governance**, **administrative convenience**, and **cultural representation**.
- **State Reorganisation Act, 1956**:
  - Came into force on **31 August 1956**.
  - Based on recommendations of the **States Reorganisation Commission (SRC)**, 1953.
  - Marked a shift from colonial administrative units to **linguistically and culturally aligned states**.

Pre-1956 Administrative Structure
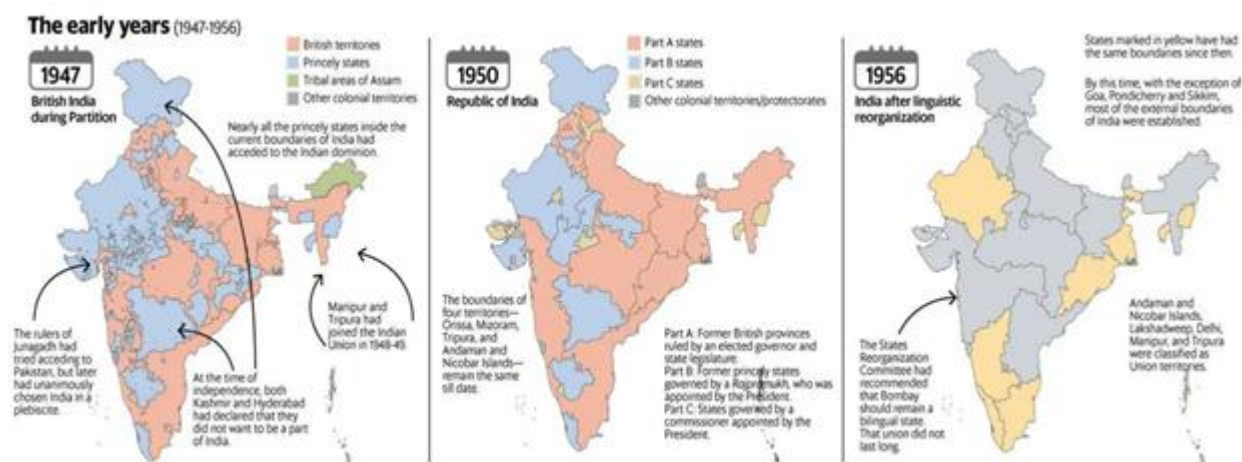
- **State Classification (1951)**:
  - **Part A**: Former British provinces (e.g., Bombay, Madras, UP).
  - **Part B**: Princely states that had signed instruments of accession (e.g., Hyderabad, Mysore, PEPSU).
  - **Part C**: Former Chief Commissioners' provinces and smaller princely states (e.g., Delhi, Bhopal, Manipur).
  - **Part D**: Only **Andaman and Nicobar Islands**, directly administered by the President.

Major Factors Behind State Reorganisation

- **Linguistic & Cultural Identity**: Andhra Pradesh was the **first linguistic state** (1953), created after the death of **Potti Sriramulu**.
  - Language often coincided with **cultural unity** and made governance easier.
- **Tribal & Ethnic Considerations**: States like **Nagaland** were formed to accommodate tribal uniqueness.
- **Economic Aspirations**: Regions like **Chhattisgarh, Jharkhand, and Telangana** demanded statehood to ensure focused economic development.
- **Administrative Viability**: States like **Uttarakhand** were carved from larger units for efficient administration.

- **Security Concerns**: **Jammu & Kashmir** was reorganised in 2019 due to national security and administrative issues.

Key Commissions on State Reorganisation
- **Dhar Commission (1948)**:
    - Rejected linguistic division.
    - Favoured factors like administrative convenience and financial viability.
- **JVP Committee (1948)**:
    - Members: Nehru, Patel, Pattabhi Sitaramayya.
    - Stressed national unity over language.
    - Allowed linguistic reorganisation only if public demand was overwhelming.
- **Fazl Ali Commission (1953)**:
    - Accepted **language as a factor**, but not the sole criterion.
    - Recommended creation of **16 states and 3 Union Territories**.
    - Basis for the **States Reorganisation Act, 1956**.

Outcomes of 1956 Reorganisation
- **Post-1956 Setup**:
    - Replaced the A/B/C/D classification.
    - Created **14 states and 6 Union Territories**.
    - Passed alongside the **7th Constitutional Amendment Act (1956)**.
    - **Examples**:
        - **Kerala (1956)**: Formed by merging Travancore-Cochin with Malabar.
        - **Bombay State** was reorganised leading to Maharashtra and Gujarat.

States Created After 1956
- **1960**: **Maharashtra** and **Gujarat** (Samyukta Maharashtra and Mahagujarat movements)
- **1966**: **Punjab**, **Haryana**, and **Himachal Pradesh** (Punjabi Suba movement; Chandigarh as UT)
- **1971**: **Himachal Pradesh** granted full statehood.
- **1972**: **Manipur**, **Tripura**, **Meghalaya** became full-fledged states.
- **1975**: **Sikkim** joined India and became a state (earlier a protectorate).
- **1987**: **Goa** became a state; **Mizoram** and **Arunachal Pradesh** were upgraded from UTs.
- **2000**: **Chhattisgarh**, **Uttarakhand**, and **Jharkhand** formed from MP, UP, and Bihar respectively.
- **2014**: **Telangana** formed from Andhra Pradesh after prolonged agitation.
- **2019**: **Jammu & Kashmir** reorganised into **two UTs: J&K and Ladakh** (Article 370 revoked).

Ongoing and Emerging Statehood Demands
- **Uttar Pradesh**: Proposals to divide into Purvanchal, Bundelkhand, Awadh Pradesh, and Pashchim Pradesh.
- **Vidarbha**: Eastern Maharashtra demand for separate statehood.
- **Other Demands**:
    - **Gorkhaland** (North Bengal), **Bodoland** (Assam), **Maru Pradesh** (Rajasthan)
    - **Kamtapur**, **Coorg**, **Rayalaseema**, **Saurashtra**, **Mithila**, **Panun Kashmir**, **Bru Land**, **Chakma territory**, and more.

Source: IndianExpress

Wise Use of Wetland

Context

India's resolution titled **"Promoting Sustainable Lifestyles for the Wise Use of Wetlands"** was adopted with overwhelming support at **Ramsar COP15** held in Zimbabwe.

About Wise Use of Wetlands (Under Ramsar Convention)

● **Core Principle:** Central concept of wetland conservation under the Ramsar Convention.
  ○ Supports **Ramsar Resolution XIV.8** on Communication, Education, Participation and Awareness (CEPA) to sensitize communities for wetland protection.
● **Definition:** Wise use means preserving the *ecological character* of wetlands using *ecosystem-based approaches* aligned with *sustainable development goals*.
● **Purpose:** Ensures both *conservation* and *sustainable utilization* of wetlands and their ecosystem services for people and biodiversity.
● **Obligation:** All Ramsar signatories must promote wise use through:
  ○ National-level plans & legal frameworks,
  ○ Effective wetland management strategies,
  ○ Public awareness and education efforts.
● Highlights India's **Save Wetlands Campaign** and **Mission Sahbhagita**, which mobilised over **2 million citizens** to ground-truth more than **170,000 wetlands**.
● India currently has **91 Ramsar Sites**, the **highest in Asia and third largest globally**, showcasing its leadership in wetland conservation.
● Supports the achievement of several **UN Sustainable Development Goals** (SDGs)—specifically SDG 6 (Clean Water), SDG 12 (Responsible Consumption), SDG 13 (Climate Action), SDG 15 (Life on Land), and SDG 17 (Partnerships).

Source: TimesOfIndia

News in Short

Nationwide Financial Awareness Saturation Campaign

News? The Nationwide Financial Awareness Saturation Campaign has reached a significant milestone in its first month.

About the Campaign

- **Objective:** To **saturate all Gram Panchayats (GPs)** and **Urban Local Bodies (ULBs)** with financial awareness and **ensure that every eligible citizen** avails the benefits of major government financial schemes.
- **Targeted Schemes:**
  - **Pradhan Mantri Jan Dhan Yojana (PMJDY) –** Financial inclusion through zero-balance bank accounts
  - **Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)** – Life insurance at affordable rates
  - **Pradhan Mantri Suraksha Bima Yojana (PMSBY)** – Accident insurance for the poor and vulnerable
  - **Atal Pension Yojana (APY)** – Retirement income security for unorganised workers.

Source: PIB
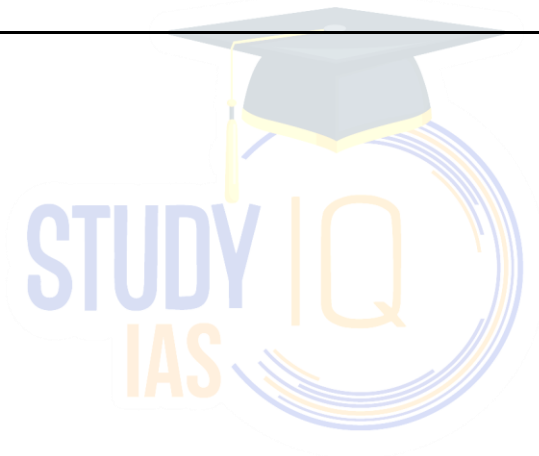
Editorial Summary

Fight Against Malaria: India's Path to Elimination

Context
● India's malaria challenge is no longer about widespread burden — it now lies in tackling hidden carriers, hard-to-reach regions, and a resilient parasite.
   ○ The 2030 elimination target is more than a deadline; it is a litmus test of how effectively science, governance, and public health can come together to conquer this age-old disease.

Forms of Malaria
● **Plasmodium falciparum (Pf)--** Most lethal form.
   ○ Causes severe symptoms and complications.
   ○ Predominant in Africa, but also exists in India.
● **Plasmodium vivax (Pv) –** Common in India.
   ○ Can remain dormant in the liver and cause **relapses**.
   ○ Harder to eliminate due to asymptomatic carriers and delayed symptoms.
● **Mixed Infections (Pf + Pv) –** Not uncommon in states like Jharkhand (up to 20% of cases).
   ○ Pose diagnostic and treatment challenges.
● **Plasmodium malariae, P. ovale, P. knowlesi –** Rare in India.
● **Zoonotic strain –** *Plasmodium cynomolgi*
   ○ A monkey malaria parasite.
   ○ Emerging as a model for P. vivax research.

Prevalence of Malaria in India
● **Reduction**: Malaria cases have dropped by **over 80% from 2015 to 2023**.
● **National Average**: Significantly improved, showing India's progress in control measures.
● **High-burden pockets remain**:
   ○ **Lawngtlai (Mizoram)** – 56 cases per 1,000 population.
   ○ **Narayanpur (Chhattisgarh)** – 22 cases per 1,000.
● **Asymptomatic cases**: Serve as silent reservoirs, especially in tribal and forested regions.

Why Malaria Eradication Still Lags
● **Biological Complexity of P. vivax:** Dormancy and relapse potential complicate treatment.
● **Insecticide and Drug Resistance:** Mosquitoes are surviving insecticides.
   ○ Parasites are evolving resistance to existing medications.
● **High Asymptomatic Carrier Rate:** Hard to detect and treat, facilitating silent transmission.
● **Health Access in Remote Areas:** Tribal belts and forested regions are underserved in healthcare.
● **Fragmented Surveillance and Diagnostics:** Weak disease tracking, especially for mixed infections.
● **Slow Vaccine Rollout:** Existing vaccines have limited efficacy or logistical barriers.

Key Initiatives for Malaria Elimination in India
● **National Framework for Malaria Elimination (NFME), 2016–2030:** Strategic roadmap targeting elimination by 2030.
● **National Centre for Vector Borne Diseases Control (NCVBDC):** Coordinates data, surveillance, and vector control.
● **Indigenous Vaccine Development**:

- ○ **AdFalciVax** (ICMR, 2025): India's **first dual-stage vaccine** (infection + transmission blocking).
  - ○ Stable at room temperature, useful in rural deployment.
- **R&D Collaborations:** ICMR, NII, RMRC, and international partners working on **PfSPZ**, **PfRH5**, and **Pvs230D1M**.
- **Transmission-Blocking Vaccines (TBVs):** Target mosquito gut stage to **halt community transmission**.
  - ○ Indian teams are actively contributing.
- **New Platforms: mRNA vaccines**, **protein-ferritin nanoparticles**, **engineered antibodies**, and **gene drive** technologies.

Way Ahead
- **Scale up Surveillance and Diagnostics:** Especially in tribal and asymptomatic zones.
  - ○ Use of AI, remote sensing, and portable diagnostic kits.
- **Fast-track Vaccine Trials and Regulatory Approval:** Accelerate **AdFalciVax** and other indigenous candidates.
  - ○ Leverage COVID-era learnings for logistics and outreach.
- **Integrate Vector Control with Genomic Monitoring:** Monitor **drug and insecticide resistance**.
  - ○ Use gene editing and gene drives with ethical safeguards.
- **Targeted Public Health Interventions:** Focus on **hotspots**, migrant labor zones, and forested areas.
- **Community Awareness and Health Worker Training:** Boost **IEC campaigns** in vernacular languages.
  - ○ Equip **ASHAs** and tribal health workers with necessary tools.
- **Cross-sectoral Coordination:** Align efforts across ministries — **Health, Tribal Affairs, Rural Development**.

Source: The Hindu

Why the world needs better green technologies

Context

India's renewable energy push faces efficiency, land, and storage challenges; next-gen technologies and policy innovation are vital for sustainable growth.

Current Renewable Energy Sources in India

As of 2025, India's installed renewable energy capacity (excluding large hydropower) stands at over **180 GW**. The key sources include:

- **Solar Energy**
  - Largest contributor among renewables (~80 GW installed).
  - Rooftop solar and utility-scale solar parks (e.g., Bhadla Solar Park in Rajasthan).
- **Wind Energy**
  - ~45 GW installed.
  - Primarily concentrated in Tamil Nadu, Gujarat, Maharashtra, and Karnataka.
- **Small Hydro Power (SHP)**
  - ~5 GW installed capacity.
  - Useful for decentralized generation in hilly areas.
- **Biomass Energy**
  - ~10 GW installed.
  - Includes bagasse cogeneration, urban and industrial waste-to-energy.
- **Waste-to-Energy**
  - Limited capacity (~0.2 GW).
  - Still in nascent stages due to regulatory and technological constraints.
- **Green Hydrogen (Emerging)**
  - Production pilot projects underway under the **National Green Hydrogen Mission**.

Challenges in Renewable Energy Deployment in India

- **Low Efficiency & Land Intensity:** Traditional **silicon solar panels** have ~15–18% efficiency.
  - Need large tracts of land for significant energy output — challenging in densely populated regions.
- **Intermittency & Storage:** Solar and wind are **intermittent** (not available 24/7).
  - Grid balancing and battery storage technologies are still underdeveloped.
- **Transmission Constraints:** Renewable-rich regions (e.g., Rajasthan, Gujarat) are far from load centers.
  - Transmission infrastructure lags behind generation capacity.
- **High Initial Investment & Financing Gaps:** Though lifecycle costs are lower, **upfront CAPEX** is high.
  - Small-scale producers struggle with financing and subsidies.
- **Import Dependence:** India imports ~80% of its **solar cells/modules**, mainly from China.
  - Weak domestic manufacturing base.
- **Environmental and Social Issues:** Wind and solar farms disrupt local ecosystems or displace communities.
  - Improper siting leads to **ecological degradation** (e.g., grasslands, forest edges).
- **Lack of Skilled Manpower and R&D:** Limited availability of trained professionals for **installation, maintenance**, and **research**.
  - Low domestic R&D spending on next-gen technologies like **perovskite solar cells, artificial photosynthesis**, etc.
- **Underdeveloped Green Hydrogen Ecosystem:** High energy consumption in **electrolysis**.
  - Difficult **storage and transportation** due to hydrogen's low density and leakage risk.

Solutions and the Way Forward

- **Invest in Next-Gen Solar Technologies:L** Promote R&D and commercialization of **perovskite**, **gallium arsenide**, and **tandem solar cells** with >30% efficiency.
  - Support indigenous innovations like **artificial photosynthesis** and **solar fuels**.
- **Enhance Battery Storage and Grid Flexibility:** Scale up **battery energy storage systems (BESS)** and pumped hydro storage.
  - Develop smart grids, demand response systems, and better **forecasting models**.
- **Expand Domestic Manufacturing (Atmanirbhar Bharat):** Strengthen PLI (Production-Linked Incentive) schemes for **solar modules, electrolysers**, and **EV components**.
  - Reduce import dependence, especially from China.
- **Rationalize Land Use and Promote Agri-Photovoltaics:** Use **rooftops, canal tops, and barren land** to minimize conflict with agriculture/forests.
  - Promote **agrivoltaics** — combining farming and solar on the same land.
- **Scale Up Green Hydrogen with Innovation:** Support **low-temperature electrolysis**, better catalysts, and **methanol/ammonia pathways**.
  - Encourage **public-private partnerships** for hydrogen infrastructure.
- **Boost Financing and De-risk Investments:** Create **green bonds**, **sovereign guarantees**, and **viability gap funding** to attract private capital.
  - Incentivize decentralised solar, especially in rural areas and MSMEs.
- **Policy & Regulatory Support:** Uniform and stable renewable energy policies across states.
  - Strengthen **Renewable Purchase Obligations (RPOs)** and grid feed-in mechanisms.
- **Focus on Skill Development and Research:** Expand skilling programs under **Skill India Mission** for solar, wind, and hydrogen sectors.
  - Create **energy innovation hubs** in collaboration with top research institutes.

Source: The Hindu