Today's Prelims Topics

One Nation One Subscription (ONOS) Scheme

Context

The focus on ONOS was renewed because the **Delhi High Court banned Sci-Hub and its mirror sites**, which many Indian researchers (especially outside elite institutions) depended on for free access to costly journals.

About ONOS Scheme

- **Type:** Central Sector Scheme
- **Objective:** To obtain **national licenses** for e-journal and database subscriptions across **STEM and social sciences**, ensuring equitable access to knowledge.
- **Nodal Ministry:** Department of Higher Education, Ministry of Education
- **Key Features:**
    - **Digital Access:** Managed by **INFLIBNET (Information and Library Network)**, a UGC centre.
        - Provides a **fully digital platform** for institutions to access subscribed journals.
    - **Monitoring & Review:** The **Anusandhan National Research Foundation (ANRF)** will periodically review **usage patterns** and the **publication output** of Indian authors.
    - **International Journals Coverage:** Provides access to **13,000 journals** from **30 leading publishers**.
- **Implementation Strategy: Department of Higher Education (DHE)** to provide a **unified access portal**.
    - Conduct **Information, Education, and Communication (IEC)** campaigns to raise awareness.

About ANRF

- **Formation**: 2023; statutory body under **ANRF Act, 2023**.
- **Organisational Structure:**
    - **Governing Board**:
        - Chairperson: Prime Minister
        - Vice-Chairpersons: Union Minister of S&T & Union Minister of Education
        - Members: 15–25 eminent researchers/professionals
    - **Executive Council**:
        - Chairperson: Principal Scientific Adviser
        - Members: Secretaries of key ministries/departments
- **Functions:**
    - Promote **R&D and innovation** in universities, colleges, research labs.
    - Foster **industry–academia–government collaboration**.
    - Create regulatory framework to **boost industry R&D spending**.
    - Prepare **short, medium & long-term R&D roadmap.**
- **Major Initiatives:**
    - **PM Early Career Research Grant (PMECRG):** Up to ₹60 lakh over 3 years for young researchers.
    - **MAHA-EV Mission:** Build domestic capacity in EV technologies: battery cells, power electronics, drives, charging infra.

Source: The Hindu

INS Udaygir & Himgiri

Context

The Indian Navy simultaneously commissioned INS Udaygiri and INS Himgiri, at Visakhapatnam.

About INS Udaygiri & Himgiri

- **Type**: Nilgiri-class stealth guided-missile frigates.
- **Developed by:**
  - **INS Udaygiri**: Built by **Mazagon Dock Shipbuilders Ltd (MDL), Mumbai**.
  - **INS Himgiri**: Built by **Garden Reach Shipbuilders & Engineers (GRSE), Kolkata**.
- **Key Features:**
  - Part of **Project 17A** (7 frigates planned: 4– Nilgiri, Udaygiri, Taragiri, and Mahendragiri by MDL, 3 –Himgiri, Dunagiri, and Vindhyagiri by GRSE).
  - **Design**: Navy's Warship Design Bureau.
  - **Propulsion**: CODOG (Combined Diesel or Gas).
  - **Stealth**: Smaller radar cross-section despite larger hull size.
  - **Weapons & Systems:**
    - **Surface-to-Air**: Long-Range SAM (Barak 8).
    - **Surface-to-Surface**: 8 BrahMos cruise missiles.
    - **Anti-Submarine**: Torpedoes, Indigenous Rocket Launchers (IRL), sonar Humsa (NG)
    - **Guns**: 127 mm main gun, 2 × AK-630 rapid-fire guns
    - **EW & Surveillance**: Shakti EW Suite, Multi-mission surveillance radar, airborne early warning radar.
  - Both names revive earlier ships decommissioned in **2007 (Udaygiri)** and **2005 (Himgiri)**.

Source: Indian Express

Comprehensive Modular Survey: Education, 2025: Data

Context

The **CMS Education Survey**, part of the 80th round of National Sample Survey (NSS) was released.

Key Findings CMS Education Survey

- **Enrollment in government schools dominate** rural education, but urban families prefer private schools due to quality concerns.
    - E.g., Govt. schools = **55.9% enrolment overall** (Rural: **66%**, Urban: **30.1%**).
- There is a **deep inequality in education affordability** between govt. and private schooling.
    - **E.g.,** Avg household expenditure per student = **₹2,863 in govt. schools** vs **₹25,002 in non-govt. Schools**.
- **Private coaching** is filling the gaps left by school education, **creating additional financial burden**.
    - **E.g., 27% of students** take private coaching and average annual spend on coaching = **₹3,988 urban**, **₹1,793 rural**; rises sharply at higher secondary (Urban: **₹9,950**, Rural: **₹4,548**).
- **Scholarship and state support in education are negligible**, pushing families to bear the cost.
    - **E.g.,** 95% of students rely on family funding, government scholarships are the primary source for only **1.2% students**.

About National Sample Survey (NSS)

- A **large-scale household survey programme** conducted in India since **1950**.
- Managed by the **National Sample Survey Office (NSSO)**, now merged under the **National Statistical Office (NSO)** in the **Ministry of Statistics & Programme Implementation (MoSPI)**.
- **Purpose**: Collect **socio-economic data** through household surveys across India.
    - Covers areas like **employment & unemployment, consumer expenditure, health, education, housing, migration, social consumption, industry & services**.
- **Features:**
    - Conducted in **"rounds"**: each round has a specific theme (e.g., 68th round: employment, 71st round: health).
    - The **80th round (2022–23)** included the **CMS Education Survey** on household expenditure in school education.
    - **Coverage**: Nationwide, covering **both rural and urban areas**.
- **Significance**:
    - Provides the **largest household-level data source** for policy-making in India.
    - Used in **budgeting, planning, poverty estimates, labour force statistics, social welfare schemes**, etc.
    - Forms basis for several reports including **Periodic Labour Force Survey (PLFS)** and **Household Consumer Expenditure Survey**.

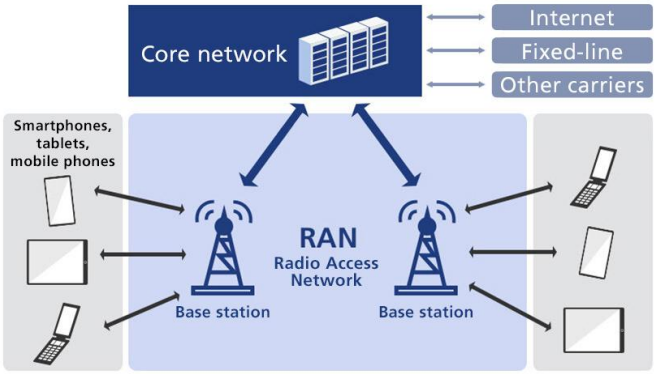
Source: PIB

Radio Access Networks (RAN)

Context

India hosts first-ever 3GPP RAN meetings on 6G standardization in Bengaluru.

About RAN



- It is part of a telecom network that connects user devices (mobiles, laptops, IoT) to the **core network** via radio signals.
- **Components:**
  - **Antennas** – transmit & receive signals.
  - **Radios** – convert digital ↔ radio signals.
  - **Baseband Units (BBUs)** – handle signal processing, error correction, encryption.
  - **Backhaul** – fiber/microwave links connecting RAN to the core network.
- **Types:**
  - **Traditional RAN:** All equipment (antenna, radio, baseband) is installed at each tower site.
    - Hardware and software are tightly coupled from a **single vendor**.
  - **Centralized RAN (C-RAN):** Processing units (baseband) are moved to a **central location** (BBU pool).
    - Towers only have antennas + radios.
  - **Virtualized RAN (vRAN):** Baseband functions run on **cloud/virtual servers** instead of physical hardware.
  - **Open RAN (O-RAN):** Based on **open standards** so equipment from different vendors can work together.

Difference Between 5G and 6G

Aspect	5G	6G
Speed	Up to 10 Gbps	Expected up to 1 Tbps
Latency	~1 ms	<0.1 ms (ultra-low)
Spectrum	Uses sub-6 GHz & mmWave (24–100 GHz)	Will use **terahertz band (100 GHz–1 THz)**
Applications	AR/VR, IoT, smart cities, autonomous vehicles	Holographic communication, tactile internet, digital twins, advanced AI integration
Energy Efficiency	Improved over 4G but still high consumption	Designed for ultra energy-efficiency & green networks

Source: PIB

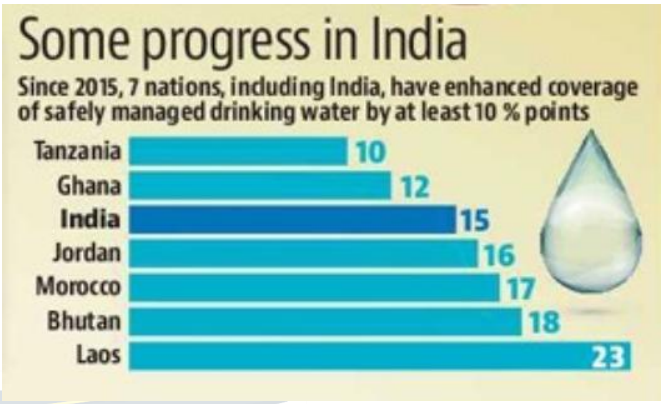
WHO and UNICEF Report on Household Drinking Water and Sanitation

Context

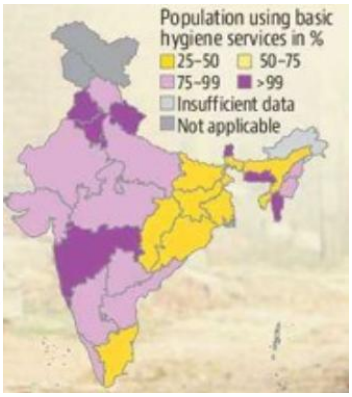
WHO and UNICEF launched "Progress on Household Drinking Water and Sanitation 2000–2024: special focus on inequalities" during World Water Week 2025.

Global Situation

- **2.2 billion people** lack access to **safely managed drinking water**.
- **696 million people** have no **basic drinking water service** at all.
- Vulnerable groups most affected:
    - People in low-income countries.
    - Populations in fragile contexts/conflict zones.
    - Rural communities.
    - Children.
    - Minority, ethnic, and indigenous groups.



- **India's Status:**
    - **34 million people** in India still lack **basic drinking water**.
    - Since 2015, India has seen **significant improvement** in safely managed drinking water coverage (at least +10%)
    - However, there are **state-wise disparities**:
        - **High coverage**: Sikkim (96%).
        - **Low coverage**: Odisha (29%).
    - Rural areas continue to lag behind urban areas in access.



Positive Trends

- Since 2015, **961 million people worldwide** gained access to safely managed drinking water.
- Coverage rose from **68% to 74%**.
- **270 million fewer people** now lack safely managed drinking water.

Source: MSN

News in Short

UNNATI (Upgrading Norms for Nutrition, Growth, and Development Assessment of Indian Children)	**News?** The Indian Council of Medical Research (ICMR) has launched UNNATI (Upgrading Norms for Nutrition, Growth, and Development Assessment of Indian Children) in Delhi, Pune, and Bengaluru. **About it** ● **Objective**: Track physical growth (height, weight) and neurodevelopmental milestones (cognitive, motor, social skills) in healthy Indian children. ● **Output**: Build **India-specific benchmarks** for growth and nutrition to guide clinicians, parents, and policy. ● **Approach**: Large-scale prospective cohort study from birth. **Related Fact:** ● In India, obesity among children (5–19 years) rose from **0.4 million in 1990 to 12.5 million in 2022** (Lancet study). **Recent Initiatives by Indian Government Addressing Malnutrition and Obesity Among Children** ● **POSHAN Abhiyaan (Mission Poshan 2.0)**: Flagship nutrition mission to reduce malnutrition and promote balanced diets. ○ **Poshan Pakhwada 2025:** Helps Anganwadi workers detect, refer, and treat malnourished children locally using Poshan Tracker. ○ **Facial Recognition for Take-Home Rations (2025):** Mandatory biometric authentication via Poshan Tracker app to ensure transparency in nutrition delivery; faces challenges in rural areas due to poor connectivity. ● **ICDS (Integrated Child Development Services)**: Anganwadi-based scheme for supplementary nutrition, health check-ups, early education. ● **CBSE Oil Boards & Healthy Food Guidelines**: Promoting healthy eating and physical activity in schools. **Source:** Live Mint
New World Screwworm	**News?** The first human case of New World screwworm infection was reported in the U.S. **About New World Screwworm (Cochliomyia hominivorax)** ● **Habitat**: Found in **South America and the Caribbean**; reemerging in Central America. ● **Features:** ○ **Type**: A parasitic **blowfly** (blue-grey in colour). ○ **Infection (Myiasis):** Females lay eggs on **open wounds or entry points** (e.g., nasal cavity) of **warm-blooded animals** and rarely humans. ■ Each female can lay **up to 300 eggs at once** and **3,000 eggs** in her 10–30 day lifespan. ■ Eggs hatch into **larvae (maggots)**, which burrow into wounds with **sharp mouth hooks**, feeding on **living flesh**. ■ After feeding, larvae drop to the soil, pupate, and emerge as **adult flies**.

	• **Symptoms**: Non-healing wounds, foul odour, bleeding sores, larvae movement under skin. • **Control Method**: **Sterile Insect Technique (SIT)** eradicated screwworm in **US (1966)**, **Mexico (1970s)**, and **Central America (2000s)**; used again in **Florida (2017 outbreak)**. **Source:** Indian Express

Editorial Summary

How Global Warming is affecting India's Monsoon Patterns

Context

Global warming is making India's southwest monsoon increasingly unpredictable by weakening traditional circulation patterns and fueling extreme weather with excess atmospheric moisture.

India's Southwest Monsoon

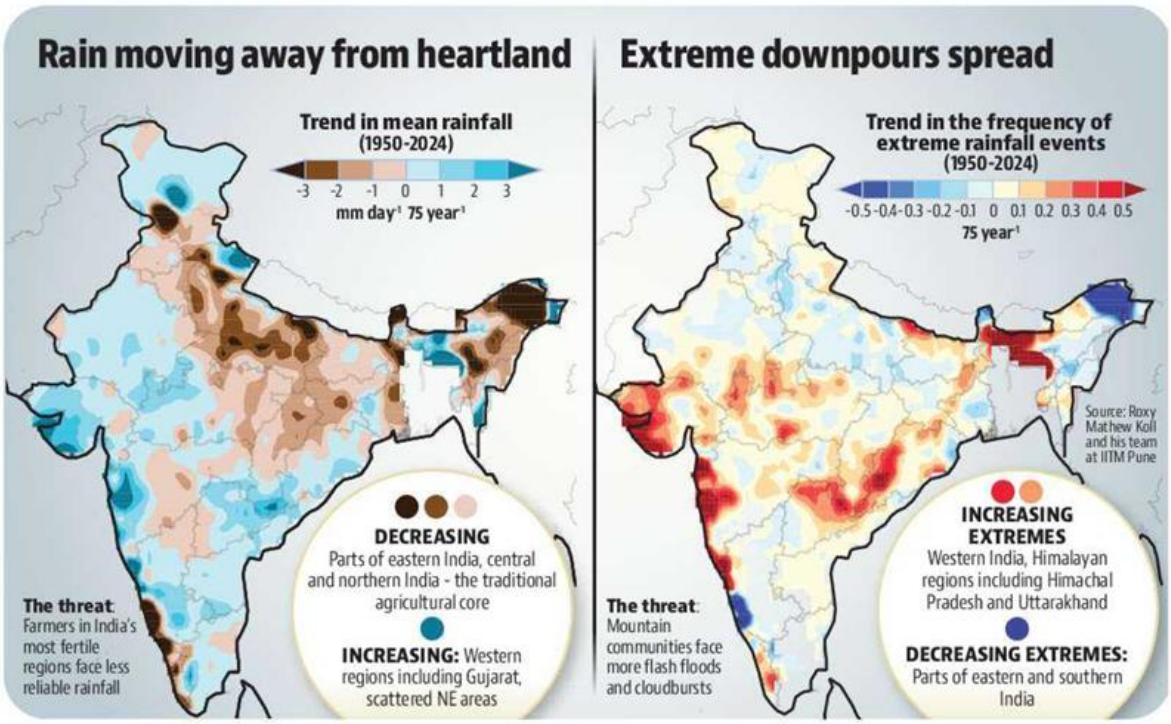
- It refers to the seasonal reversal of winds bringing moist air from the Indian Ocean to the Indian subcontinent, causing ~75% of India's annual rainfall.
- **Causes:**
  - **Differential heating**: Land heats faster than the ocean → creates low pressure over the Indian subcontinent, drawing in moist oceanic air.
  - **ITCZ shift**: Inter-Tropical Convergence Zone (ITCZ) moves northwards over India during summer, aiding monsoon onset.
  - **Tropical Easterly Jet**: Helps in transporting moisture into the subcontinent.
  - **Orography**: Western Ghats, Himalayas block moist winds, leading to heavy rainfall on windward sides.
- **Significance:**
  - **Agriculture**: Supports ~50% of India's net sown area and ~40% of food production.
  - **Water Resources**: Recharges groundwater, rivers, reservoirs.
  - **Economy**: Impacts food security, inflation, energy (hydropower), and rural livelihoods

Causes/Drivers of Monsoon Changes

- **Weakened monsoon circulation:** Rising sea levels and rising temperatures have disrupted the pressure gradients that traditionally drive monsoon winds.
- **Warming and moisture paradox**: Increased atmospheric temperatures allow air to hold ~7% more moisture per °C, leading to heavy rain bursts separated by longer dry spells.
- **Ocean–atmosphere dynamics**: Enhanced ocean warming promotes upward moist air movement over the equatorial ocean, triggering dry descending air (subsidence) over land and inhibiting rainfall.
- **Tropical Easterly Jet weakening**: The weakening of this jet has contributed to reduced rainfall in central and certain parts of northern India.
- **Regional warming effects**: Warming in the Middle East and Arabian Sea has intensified pressure gradients, drawing more moisture toward west and northwest India.
- **Climate change–driven variability**: Climate models predict a surge in extreme rainfall and delayed/unpredictable monsoon onset and progression.
- **Anthropogenic Causes:**
  - **Greenhouse Gas Emissions (Global Warming):** Rising CO_2 and other GHGs → increase surface air temperature → Warmer air holds more moisture, causing **intense downpours** and **longer dry spells**.
  - **Aerosols & pollution** → reduce sunlight (dimming), alter cloud formation.
  - **Deforestation & land use change** → less evapotranspiration, disturbed local rain cycles.
  - **Climate Change–Induced Ocean Alterations:** Anthropogenic warming has **raised Indian Ocean temperatures**, shifting circulation patterns (Indian Ocean Dipole) → Weakens **Tropical Easterly Jet** and monsoon circulation.

Impacts

- **Geographic shift in monsoon rains:**
  - **Rain moving away from heartland:** Decrease in rainfall over eastern, central, northern India (traditional agricultural core). Increase in western regions like Gujarat and scattered northeast areas.
  - **Extreme downpours spread:** Increase in western India and the Himalayan regions (Himachal Pradesh, Uttarakhand); decrease in parts of eastern and southern India.
- **Intensifying humid heat:** Alternating dry and wet spells with high moisture during dry phases increase heat stress on populations.
- **Monsoon-linked public health risks**: Conditions of >27 °C temperature, moderate rain, and 60-78% humidity elevate dengue risk.
- **Record monsoon extremes (2025)**: North India experienced its wettest monsoon in 12 years-21% above normal-with record "extremely heavy" rainfall events.
- **Glacial and Himalayan risks**: Accelerated glacier melt raises flood and landslide risk; monsoon flooding already caused mass casualties.
- **Urban flooding & infrastructure stress**: Mumbai's August 2025 rains nearly doubled average monthly totals.



Challenges Ahead

- **Forecasting weakening:** The weakening traditional links, such as El Niño–monsoon coupling, hinder seasonal prediction.
- **Cloudburst monitoring gaps**: Extremely sudden, localized cloudbursts (>100 mm/hour) are increasingly deadly but poorly monitored.
- **Infrastructure & civic preparedness**: Cities struggle to handle flash floods-Hyderabad's drainage was overwhelmed, despite 155 weather stations and response planning.
- **Health & migration**: Climate-linked health burdens (like dengue) and displacement risks rise amid changing monsoon regimes.

Way Forward / Strategic Measures

- **Better monitoring & forecasting:** Closing gaps in cloudburst detection and seasonal forecasting systems.

    - **Scientific innovations:** AI + satellite data for nowcasting; Doppler radars expansion.
- **Public health adaptation**: Plan for dengue risk based on temperature and humidity trends.
- **Early warning systems & localized planning**: Urgent need for granular, tehsil-level monsoon action plans based on regional variability.
- **Urban resilience**: Implement climate-resilient infrastructure: lakes/ponds, clear drains, green spaces; seen as critical after Delhi floods.
- **Resilient agriculture:** Drought-resistant & flood-tolerant varieties (e.g., Submergence-tolerant rice "Swarna-Sub1").
- **Mitigation-greenhouse gas reductions**: Long-term adaptation must be coupled with aggressive GHG reduction-emissions control remains vital.
- **Policy initiatives**: Strengthen climate-resilient agriculture, urban planning, and disaster management under NAPCC and Panchamrit commitments.
- **Community awareness & public health outreach**: Educate vulnerable communities about heat, health risks (like dengue), and emergency protocols.

Source: Hindustan Times, TOI

Suspension of Import Duty on Cotton

Context

The government has suspended import duty on cotton in 2024–25 to address falling domestic production and rising raw material costs for the textile industry

About Cotton

- Cotton is a **kharif crop.** It is grown mainly for its **fiber** (used in textiles) and **seeds** (used for oil and fodder).
- It is also called **"White Gold"** because of its economic importance to farmers and the textile industry.
- India is the **largest producer** of cotton globally, it accounts for **23%** of total global cotton production.
- **Ideal Conditions for Cotton Cultivation**
    - Warm, dry climate with uniformly high temperatures (21°C to 30°C)
    - Frost-free period of at least **200 days**
    - Moderate rainfall **(50-100 cm).**
- **Major Cotton Producing States in India:** (1) Gujarat (2) Maharashtra (3) Telangana

Current Situation (2024–25)

- **Production Decline**: Down to **294 lakh bales** (lowest in 15 years) vs demand of 318 lakh bales.
- **Imports Rising**:
    - 40 lakh bales projected (highest ever).
    - Import value: **$1.20 billion** (107% surge from last year).
    - Key suppliers: **Australia, U.S., Brazil, Egypt**.

Implications of Duty Withdrawal

- **For Industry & Exporters (Positive)**
    - Imported cotton becomes cheaper → lowers raw material cost.
    - Garment exporters get a **level playing field** in international markets.
    - Beneficial during raw material shortage.
- **For Farmers (Negative)**
    - Removal of duty may **discourage cotton cultivation**.
    - Farmers fear **lower domestic prices** due to cheaper imports

Why is Cotton Production Declining in India?

- **Pink Bollworm (PBW)**
    - **PBW is a pest** whose larvae damage cotton bolls (fruits), destroying seeds and lint (cotton fiber).
    - It has **developed resistance to Bt cotton** (GM variety used in India).
- **No New GM Approvals**
    - Existing Bt cotton (with cry1Ac and cry2Ab genes) is now **ineffective**.
    - **New GM hybrids** developed by Indian companies are stuck in **regulatory trials**.
    - No GM crop has been commercialised since **2006** due to opposition and long approval processes.
- **Climate Change:** Erratic rainfall, unseasonal rains and long dry spells affect cotton growth.
- **Low Profitability:** Rising **input costs** (seeds, fertilizers, pesticides).
- **Monocropping & Poor Crop Rotation:** Continuous cotton cropping without rotation → **soil nutrient depletion** and **pest buildup**.

Long-Term Solutions Suggested

- **Stable Policy Framework:** Suspend duty during **non-peak season (April–Sept)** to balance farmer & industry interests.
- **Financial Support to Mills**: 5% **interest subvention** on working capital for mills to buy cotton during peak season.
    - This reduces the government. burden on MSP operations.
- **Boost Productivity**: Better seeds, modern cultivation practices, and pest control to raise yields.
- **Diversified Cotton Sources**: Promote organic/extra-long staple cotton domestically to reduce import dependence.
- **Seed Innovation:** Fast-track next-gen GM/CRISPR cotton under strict biosafety + public sector R&D.
- **Diversification:** Encourage crop rotation (soybean, pulses) to reduce pest cycles + soil degradation.
- **Water-Smart Cotton:** Promote drip irrigation + organic cotton in water-stressed regions.

Source: The Hindu