UPSC Daily Current Affairs| Prelimbits 05-07-2025

C-FLOOD

Prelims: Current events of National and International Importance

Why in News?

Union Minister of Jal Shakti, Shri C. R. Patil, inaugurated C-FLOOD, a Unified Inundation Forecasting System.

- **C-FLOOD –** It is a **web-based flood forecasting platform** that provides.
  - Two-days advance inundation forecasts
  - Village-level flood inundation maps
  - Water level predictions
- It integrates flood modelling outputs from both national and regional agencies to act as a **comprehensive decision-support tool** for disaster management authorities.
- **Development** – The system was developed collaboratively by,
  - Centre for Development of Advanced Computing (C-DAC) Pune,
  - Central Water Commission (CWC), and
  - National Remote Sensing Centre (NRSC).
- **Project execution** – The project is executed under the **National Supercomputing Mission (NSM)** and jointly steered by,
  - Ministry of Electronics and Information Technology (MeitY)
  - Department of Science and Technology (DST)
- **Technical Features of C-FLOOD** – It uses advanced 2-D hydrodynamic modelling to simulate flood scenarios.
- Runs simulations for Mahanadi Basin using High-Performance Computing (HPC) infrastructure at C-DAC Pune.
- Integrates flood forecasting outputs for Godavari and Tapi Basins, developed by NRSC under the National Hydrology Project (NHP).
- Future plans include expanding coverage to all major river basins across India.

Significance and Benefits

- It enhances flood preparedness by providing early warning at a local (village) level.
- It improves decision-making for disaster response authorities.
- It supports integration of forecasts into the National Disaster Management Emergency Response Portal (NDEM).
- It promotes public awareness and proactive disaster management.
- It helps in planning inundation studies for all river basins to mitigate flood risks.

Reference

PIB| C-FLOOD, a Unified Inundation Forecasting System

BHARAT Study

Prelims: Current events of National and International Importance | science and technology.

Why in News?

Recently, the Indian Institute of Science (IISc), Bengaluru, has launched the BHARAT study under its Longevity India Program.

> *Longevity IndiaPrograme is a initiative launched by IISc in 2024 to support ageing research in India.*

- **BHARAT –** It stands for Biomarkers of Healthy Aging, Resilience, Adversity, and Transitions.
- **Aim** – It is the pan-India research that aims to create the country's first comprehensive database to understand **ageing patterns unique to the Indian population**.
- It will be identified through identification of biological, physiological, environmental, and lifestyle factors that influence healthy ageing among Indians.
- **Bharat baseline development –** It will create India's first population-specific database defining "**normal**" **health parameters** for Indians.
- The reference values tailored to Indian genetic, socio-economic, and environmental conditions.

Key Features of BHARAT Study

- **Multi-Omics analysis –** Comprehensive biological profiling, including,
  - **Genomics –** Detection of disease-linked genetic variants.
  - **Proteomics –** Analysis of serum proteins.
  - **Metabolomics –** Study of metabolites indicating health status.
  - **Lipidomics –** Examination of lipid composition.
  - **Epigenomics –** Exploration of gene expression regulation.
  - **Metagenomics –** Gut microbiome analysis.
- **Health assessment –** Physical examinations to track functional decline and cognitive tests to monitor mental health.
- It will also do immune system analysis for resilience indicators.
- **Lifestyle & environmental factors –** Mapping of diet patterns, physical activity, and environmental exposures.
- **AI and Machine Learning integration –** Use of AI to analyse complex, multi-dimensional datasets.
- Simulation of interventions to predict their impact on ageing and health outcomes.

Significance of BHARAT

- It provides reliable, Indian-specific health benchmarks.
- It enables early detection of age-related diseases.
- It helps design better diagnostics and treatments for Indians.
- It bridges the gap between global research and India's healthcare needs.
- It positions India at the forefront of global ageing and longevity research.

Reference

The Hindu| The Indian Institute of Science launches BHARAT study

SAKSHAM-3000

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Why in news?

Recently, Minister of State for Communications launched SAKSHAM-3000 High-Capacity Switch-Cum-Router.

- **SAKSHAM-3000** – It is a state-of-the-art data centre switch-cum-router designed for next-generation digital infrastructure.
- **Developed by** – Centre for Development of Telematics (C-DOT).

> *C-DOT is the Telecom Technology development centre was established in August 1984 as an autonomous body under the Department of Telecommunications (DoT), Ministry of Communications*

- **Traffic manager** – It acts a traffic manager that help to build stronger, faster, and more secure internet and communication networks for the country.
- Whenever huge amounts of data like phone calls, internet browsing, videos, or cloud storage is transmitted, this machine ensures they move quickly, smoothly.

Technical specifications

- **Ultra-low latency** - There is almost no delay and the information travels extremely fast from one point to another.
- **Capability** – It can handle up to 25.6 Terabits of data per second.
- **PTP (Precision Time Protocol)** – It keeps all parts of the network perfectly in sync, like setting the same clock for everyone.
- **Sync-E (Synchronous Ethernet) –** It ensures stable and accurate timing in internet networks.
- **WRR (Weighted Round Robin)** – Distributes data fairly among different users, avoiding congestion.
- **WRED (Weighted Random Early Detection)** – Detects potential overload early and prevents network slowdowns.

Applications of SAKSHAM-3000

- **5G and 6G mobile networks –** It helps in building fast and reliable next-generation mobile networks.
- **Data centres –** It is used in large computer facilities where huge amounts of data are stored and managed.
- **Cloud computing –** It supports cloud-based services like online storage, streaming platforms, and apps.
- **Artificial Intelligence (AI) workloads –** It handles the heavy data requirements of AI technologies, making AI applications faster and more reliable.
- **Government and defence networks –** It provides secure and high-speed communication for defence and critical government operations.
- **Smart Cities & IoT networks** – It supports digital infrastructure required for smart cities, connecting sensors, cameras, and other devices.

Reference

PIB| SAKSHAM-3000

Gaden Phodrang Trust

Prelims: Current events of National and International Importance

Why in news?

Recently, the 14th Dalai Lama affirmed that the Gaden Phodrang Trust will be the sole authority to recognize his future reincarnation.

- **Gaden Phodrang** – It is registered in 2011 in Dharamshala, India that is specifically tasked with recognising the Dalai Lama's reincarnation.
- **Origin** – Gaden Phodrang originally refers to the residential quarters of Dalai Lamas at Drepung Monastery, Lhass, the capital of the Tibet Autonomous Region.
- Later, it became a term used for the **Tibetan Government-in-Exile**, established after the 14th Dalai Lama who fled to India in 1959.

The 14th Dalai Lama (Lhamo Thondup), born in 1935 in Tibet, was officially enthroned in 1940, at the age of 4-5 years.

- **Chinese involvement post-1959 –** After Tibet came under Chinese control, the Chinese government claimed authority to approve or reject reincarnations of high Lamas, including the Dalai Lama.
- The Chinese authorities introduced the controversial **"Golden Urn" method**, giving the state power to approve reincarnations, which many Tibetans reject.
- Due to increasing Chinese interference in September 2011, the 14th Dalai Lama issued a formal statement outlining the process for identifying his reincarnation.

Other Associated Institutions
Dalai Lama Trust
• **Dalai Lama Trust (India) –** Established in **2009**, New Delhi-based non-profit. • It funds Tibetan education, culture, and secular ethics programs and promotes, - Tibetan welfare - Human values - Interfaith harmony - Global peace
Gaden Phodrang Foundation
• **Gaden Phodrang Foundation (Switzerland) – It is a non-profit and**, overseen by Swiss federal authorities. • It focuses on, - Preserving Dalai Lama tradition - Promoting peace, nonviolence, environmental care - Fostering cross-religious understanding - Supporting global humanitarian efforts • It also funds on education & science initiatives of Buddhist philosophy publications and translations. - Programs bridging science and religion. - Scholarships and access to Buddhist knowledge.

Reference

The Indian Express| Gaden Phodrang Trust

Ten Most Powerful Space Telescopes

Prelims: Current events of National and International Importance | science and technology.

Why in news?

Space telescopes are frequently in news due to ongoing discoveries and advancements in space exploration.

- **Space telescopes** — Telescopes that orbit above the Earth's atmosphere to observe the Universe (planets, stars, galaxies) closely with significant clarity.
- **Advantages** - They *can* access to a wider electromagnetic spectrum, enabling them to detect the wavelengths of light (such as X-rays, gamma rays, infrared).
    - Unaffected by weather, day-night cycles, they enable long-duration exposures uninterrupted cosmic observation.
    - Bypassing atmospheric blurriness can capture clear images.

The first ever space telescope, the Orbiting Astronomical Observatory 2 (OAO-2), was launched into the low Earth orbit in 1968 aboard an Atlas-Centaur rocket, as per the National Space Centre.

s.no	Telescope	Description
1.	James Webb Space Telescope	• Launched in - **2021**. • largest and the most powerful observatory. • designed to conduct infrared astronomy. • Agencies overlooking - **NASA, ESA, CSA.**
2.	Hubble Space Telescope	• Launched in - **1990**. • Discovering dark energy, observes the cosmos in ultraviolet, visible and near infrared, from the low Earth orbit. • Operated by - **NASA and ESA**.
3.	Chandra X-ray observatory	• Launched in - **1999**. **NASA's** flagship mission for *X-ray astronomy, detects X-ray emissions*. • The electrical power required to cooperate the Chandra spacecraft and instruments is very less (2KW).
4.	Spitzer Space Telescope	• Launched in - **2003**, **NASA's**, retired in 2020. • Spitzer made the first exoplanet weather map of temperature variations over the surface of a gas exoplanet.
5.	Planck Space Observatory	• Launched in - **2009**. • **ESA's** first mission to study the *Cosmic Microwave Background (CMB)*, the relic radiation from the Big Bang.
6.	Gaia	• Launched in - **2013**. • The telescope's extraordinarily precise three-dimensional map will provide the data needed to tackle history of our galaxy.
7.	Fermi Gamma-ray Space Telescope	• Launched in - **2008**. • **NASA's** telescope detects gamma rays, the most energetic form of light. • to address questions revolving around "crushed stellar remnants like pulsars.
8.	TESS (Transiting Exoplant Survey Satellite)	• Launched in - **2018** as a follow-up to Kepler, **NASA's** TESS is responsible for discovering exoplanets.
9.	Euclid Space Telescope	• **ESA** mission with critical contributions from NASA that aims to explore dark matter and dark energy.
10.	XRISM (X-ray Imaging and Spectroscopy Mission)	• Launched in - 2023, **NASA** has partnering with **JAXA** on the XRISM mission to study celestial objects that emit X-rays.

Reference

Indian express| 10 most powerful space telescopes

One Liners 05-07-2025
History, Art and Culture

Punyatithi of Swami Vivekananda

July 4th, marks the Punyatithi of Swami Vivekananda, a revered Indian saint, philosopher, and the Father of Modern Indian Nationalism.

• **Early Life-** Born Narendranath Datta in 1863, he became a disciple of Ramakrishna Paramhansa. In 1893, he adopted the name Vivekananda.

• **Core Message -** Vivekananda emphasized unity, peace, service, and the divinity in every being. He spread the teachings of the Upanishads and Bhagavad Gita, integrating insights from Buddha and Jesus.

• **Chicago Speech (1893) -** His iconic "Sisters and Brothers of America" address at the Parliament of the World's Religions introduced Vedanta and Yoga to the West, establishing him as a global spiritual leader.

• **Contribution -** He championed character-building education and selfless service. He outlined four paths to spiritual liberation: Raja Yoga, Karma Yoga, Jnana Yoga, and Bhakti Yoga.

• **Mission** - In 1897, he founded the Ramakrishna Mission with the motto: "Atmano Mokshartham Jagat Hitaya Cha" (for one's own salvation and for the welfare of the world), focusing on education, health, and spiritual guidance.

• **Passing -** Swami Vivekananda passed away on **July 4, 1902**, at Belur Math, believed to have attained mahasamadhi.

Geography

Roll Cloud

Recently, a rare roll cloud recently captivated observers over Portugal’s coastline, formed by the collision of a cool Atlantic air mass with hot, dry air during an intense European heatwave.

• **Roll Cloud** - A roll cloud is a rare, low-level, horizontal, tube-shaped cloud that appears to roll as it moves. Unlike funnel clouds, it is not attached to any thunderstorm or rotating vortex.

• **Commonly observed** - In coastal regions where oceanic and continental air masses interact, such as the U.S. Plains, Australia's Gulf of Carpentaria, and European Atlantic coasts.

• **Formation -** They form when cool, moist maritime air undercuts hot, dry continental air, triggering atmospheric gravity waves. Adiabatic cooling and condensation in the rising wave limb create the cloud.

• **Characteristics -** Roll clouds are long, tube-shaped, low-lying, often stretching hundreds of kilometers. They are detached from parent cloud systems and frequently appear in the morning, appearing to roll horizontally.

• **Significance -** Primarily a visual phenomenon, roll clouds indicate instability in the lower atmosphere and temperature gradients, sometimes acting as a precursor to storm development.

Social Issues

Sabrang Clinic India's First Transgender-Led Health Center

Recently, India's first health clinic entirely staffed and managed by transgender individuals, has reopened in Hyderabad. Formerly Mitr Clinic, it faced a shutdown after USAID's funding freeze but now has renewed support from Tata Trusts.

• **Sabrang Clinic** - Provides specialized, stigma-free healthcare for the transgender community, managed and run exclusively by transgender individuals.

• **Services Offered -** The clinic offers a range of vital services, including gender-affirming care, HIV/AIDS treatment, mental health support, and general healthcare.

• **Addressing Disparities -** It directly tackles the healthcare disparities and discrimination transgender people often face in mainstream medical facilities.

• **Community Empowerment -** Beyond healthcare, Sabrang Clinic empowers the transgender community by creating crucial employment opportunities within the healthcare sector.

• **Renewed Funding -** The clinic's reopening is a significant victory, enabled by renewed funding from **Tata Trusts**, ensuring its continued operation and impact.

Polity & Governance

Mahayogi Gorakhnath University

The **President of India** visited Gorakhpur in UP, to inaugurate and lay foundation stones for several projects at **Mahayogi Gorakhnath University**, a significant event for eastern Uttar Pradesh's education and healthcare.

• **Holistic Medical Education -** President Murmu lauded the University's integration of modern (Allopathy) and traditional (Ayurveda) medicine, noting its medical and Ayurveda colleges, and the upcoming 1800-bed hospital.

• **Supporting NEP 2020 -** She emphasized private universities' role in nation-building under the National Education Policy (NEP) 2020, recognizing Mahayogi Gorakhnath University as a vital educational hub in the Purvanchal region.

• **Women's Empowerment -** The President expressed pride in laying the Girls' Hostel foundation, highlighting its importance in providing safe housing and enabling more girls to pursue higher education.

Indore Launches India's First Digital House Address Project

In a recent landmark move under the Smart Cities Mission, Indore Municipal Corporation (IMC) has launched India's first Digital House Address Project, replacing conventional addresses with QR codes and GPS technology.

• **Pilot Launch** - The project successfully launched in Ward 82 of Sudama Nagar, marking the initial deployment of QR-based address plates integrated with the national Digipin system.

• **Key Features** - Each household receives a QR-coded metal plate linked to precise GPS coordinates. This integrates with Digipin and provides direct access to civic services via mobile scan.

• **Process** - Scanning the QR code on the affixed plate reveals exact location details, allowing users to interact with a portal for tax payments, complaints, or record viewing.

• **Aim to** – Simplify address identification, enhance service delivery, improve emergency response, digitize civic interaction, and foster data-driven governance.

• **Benefits** - It promises faster municipal services, improved emergency response, streamlined e-commerce deliveries, and accurate data for urban planning, boosting overall digital governance.

Tamil Nadu Launches Doorstep PDS

Recently, Tamil Nadu State government has launched a pilot project in Chennai to deliver essential commodities directly to senior citizens and persons with disabilities, improving their access to the public distribution system.

• **Mobile Shop Concept** - Vehicles equipped with essential goods — travel to beneficiaries' homes. A shopkeeper manages transactions using a weighing machine and a palm reader for identification.

• **Beneficiary Impact** - Senior citizens have expressed gratitude for the convenience of door-to-door service, particularly benefiting those with mobility challenges and fostering community support.

• **Project Coverage** - The pilot project extends across Cuddalore, Tirunelveli, and Dindigul districts, reaching diverse urban, rural, and coastal regions to ensure broad accessibility.

• **Addressing Challenges** - Consumer activist T. Sadagopan highlighted the need for effective communication strategies to inform and encourage participation among all eligible beneficiaries.

• **Enhancing Accessibility** - This initiative streamlines distribution, ensuring vulnerable populations receive necessary items, marking a significant step towards inclusive public service delivery

International Relations and Issues

Russia Recognizes Taliban Government in Afghanistan

In a significant diplomatic move, Russia has become the first country to officially recognize the Taliban government in Afghanistan since their return to power in August 2021.

• **Official Recognition -** Russia removed the Taliban from its list of banned organizations and formally accepted the credentials of Afghanistan's new ambassador, Gul Hassan Hassan.

• **Taliban's Welcome -** Afghanistan's Foreign Ministry, controlled by the Taliban, hailed Russia's decision as a "historic step," urging other nations to follow suit.

• **Background of Taliban Rule -** The Taliban regained control in August 2021 after US and NATO troop withdrawal. Most nations have withheld formal recognition due to human rights concerns.

• **Russia's Influence -** As a permanent UN Security Council member and key regional player, Russia's recognition holds significant political weight and could influence countries like China, Iran, and Pakistan.

• **Potential Impact-** This move opens the door for fuller diplomatic relations, potentially leading to wider international acceptance of the Taliban's rule and affecting regional dynamics.

Economy

Steel Authority of India Limited (SAIL)

Recently, India's Steel Authority of India Limited (SAIL) has launched its first international Representative Office in Dubai, UAE, marking a major step in its global expansion.

• **Strategic Dubai Choice** - Dubai was chosen as a strategic gateway to the Middle East and North Africa (MENA) markets, offering an investor-friendly environment and proximity to emerging steel markets.

• **National Alignment** - This expansion supports India's goal of increasing steel production to 300 million tonnes by 2030, solidifying its position as a global steel powerh