UPSC Daily Current Affairs| Prelim Bits 28-05-2025

Bharat Forecast System

***Prelims**: Current events of national and international importance.*

Why in News?

Recently India Meteorological Department (IMD) is set to operationalise the Bharat Forecast System (BFS) during the 2025 monsoon season.

- **Bharat Forecast System** - It is India's first indigenously built high-resolution deterministic weather model**.**

  Deterministic models provide a single forecast for a given set of initial conditions, for a specific location and time.

- **Developed By** - The Indian Institute of Tropical Meteorology (IITM), Pune under Ministry of Earth Sciences (MoES).
- It is in development and testing since **2002.**
- It is now officially adopted for operational use by IMD in 2025.

Current IMD models
• **Coupled Forecast System (CFS)** – It is developed initially by the National Centers for Environmental Prediction (NCEP) in the US. • It was modified under the Monsoon Mission to create a model specifically for seasonal monsoon prediction over the Indian region. • **Global Forecast System (GFS)** – It is also a coupled model, includes ocean-atmosphere interactions. • Both models operate at **12 km × 12 km resolution** (i.e., one forecast per 144 sq. km).

Key Features

- **Forecast resolution -** 6 km × 6 km (from earlier 12 km × 12 km).
- **Forecast levels -** Now accurate to **panchayat level** (a few villages), vs earlier **block level.**
- **Forecast range:**
  - **Short-term -** 3 days ahead
  - **Medium-term -** 7 days ahead
  - **Long-term** forecasts remain largely unchanged as with previous model.
- **Technological advancements –** It uses **Triangular-Cubic Octahedral (TCO)** grid structure which,

- Focuses higher resolution over **tropical regions** like India.
- More accurate in **volatile weather zones.**

TCO grid, divides the globe into triangular cells, resulting in a higher resolution over tropical regions compared to the poles.

- **Supercomputing support -** To increase accuracy of prediction the **High-Performance Computing (HPC)** systems such as **Arka, Arunika**, and **AI/ML unit** were used.

Significance

- BFS significantly improves early warnings for,
  - **Heavy rainfall**
  - **Cyclones**
  - **Localized climate variations**
- It empowers farmers, administrators, and local bodies with **precise weather alerts**.
- It is aligned with **Atmanirbhar Bharat** with fully **indigenous technology and effort.**
- **Limitation -** BFS does not improve forecasts for sudden severe thunderstorms.

India is the only country to provide operational weather forecasts at 6 km × 6 km resolution.

Reference

The Hindu| IMD to receive high resolution Bharat Forecast System

Stingless bees increase crop yield

Prelims: General issues on Environmental ecology, Bio-diversity and Climate Change

Why in News?

Researchers from Nagaland University have shown that stingless bees, which produce a high-value honey with a distinct flavour, can increase the yield and quality of crops.

- **Identified species -** Tetragonula iridipennis and Lepidotrigona arciferal identified as superior pollinators.
- **Findings** - Both species are identified as the most efficient foragers on chilli booms in the open under low hill conditions.
- The yield and quality of chilli and other crops increased several times when these stingless bees were introduced as pollinators ***under greenhouse conditions.***

- The researchers found that the fruit set in stingless bee-pollinated king chilli (Capsicum chinense) increased to 29.46% compared to the non-pollinated crop's 21% yield.
- Similarly, the fruit set in chilli (Capsicum annuum) increased by 7.42% over the non-pollinated crop.
- The seed weight, an indicator of viability or germination, also increased by 60.47% when pollinated by the stingless bees.
- The other crops used for the stingless bee pollination test included cucumber, ash gourd, watermelon, tomato, pumpkin, brinjal, and dragon fruit.
- The potential of these bees as pollinators for fruits such as mango, guava, gooseberry, and Indian jujube was also observed and recorded.
- Stingless bees are reported primarily from the northeastern, eastern, and southern Indian States.
- In the northeast, these bees are reared traditionally in homestead apiaries.

Reference

The Hindu | Sting bees in crop yield

Bow echo

Prelims: Indian Geography | General issues on Environmental ecology

Why in News?

The intense storm recently hit Delhi looked like a crescent or an archer's bow, in technical terms, such presentations of storms are called "bow echoes".

- A bow echo is ***essentially a line of storms***, also called a squall line, on the radar that looks like a bow.
- **Term coined by -** Ted Fujita, a Japanese American meteorologist known for developing the scale to classify tornadoesin the 1970s.
- This squall line can sometimes be embedded in a larger squall line.
- A bow echo can extend from ***20 km to 100 km***, and last between 3 and 6 hours.
- **Formation -** When rain-cooled air comes down to the ground, and spreads out horizontally.
- As this happens, a boundary called the gust front is created between the rain-cooled air and warm-moist air on the surface.
- This front pushes up the warm-moist air into the atmosphere, which forms new thunderstorms.
- These new thunderstorms produce more rain, thereby creating more rain-cooled air, which helps the gust front to maintain its strength.
- As this process keeps repeating itself, there comes a point when there is an inflow of air on the trailing side of the line of storms and bends it like an archer's bow.
- The cycle lasts as long as new thunderstorms keep forming at the front, helping the system grow and move forward with strong winds.

- Bow echoes are not a new phenomenon. In 2022, a bow echo was formed over Delhi and Noida. However, it was short-lived, lasting for an hour, and produced winds of up to 100 kmph.
- Such a squall line was observed during thunderstorm activity in Odisha earlier this month.

Reference

The Indian Express | Bow echo

Major achievements of Initiatives of the Ministry of Tribal Affairs

Prelims: Public policy| Government Initiatives | Current events of national and international importance.

Why in News?

Union Tribal Affairs Minister Jual Oram recently launched a booklet on the "major achievements" of the initiatives of the Ministry of Tribal Affairs in the past 11 years.

PM JANMAN programme	It is a basic scheme saturation package that brings housing, healthcare, nutrition, road connectivity, power, and drinking water interventions to 75 PVTG communities across 19 States and Union Territories across the country. The Ministry added that, under the package, 4.35 lakh houses had been sanctioned, of which 1.04 lakh houses had been completed.
Dharti Aba Janjatiya Gram Utkarsh Abhiyan	Scheme saturation package designed on the lines of the PM JANMAN package to saturate ST villages with 25 interventions by involving 17 line Ministries.
Eklavya Model Residential School scheme	It has been revamped and centralised in the past half-a-dozen years.
Pradhan Mantri Adi Adarsh Gram Yojana	Aimed at transforming villages with a significant tribal population into model villages. It focuses on achieving integrated socio-economic development through the convergence of various government schemes and by addressing infrastructure gaps in key sectors like connectivity, education, and healthcare.
Sickle Cell Elimination Mission	Announced in 2023. It targets the health challenges posed by Sickle Cell Disease (SCD), especially among tribal populations. The mission aims to eliminate SCD as a public health issue in India by 2047.
Janjatiya Gaurav Varsh	150th birth anniversary of tribal icon Birsa Munda.

Reference

The Hindu | Initiatives of the Ministry of Tribal Affairs

National Apprenticeship Promotion Scheme (NAPS) and the National Apprenticeship Training Scheme

Prelims: Public policy| Government Initiatives | Current events of national and international importance.

Why in News?

Recently, the 38th Ministry of Skill Development and Entrepreneurship (MSDE), recommended a 36% increase in stipend provided under NAPS and NATS.

National Apprenticeship Promotion Scheme (NAPS)

- **Initiated on** - 19th August 2016.
- It is an initiative from the Ministry of Skill Development and Entrepreneurship, aimed at enhancing apprenticeship training throughout India.
- The scheme provides financial assistance to organizations that implement apprenticeship programs.
- Registration for NAPS is crucial for both candidates and establishments to take advantage of this program.
- **Objectives** - To cultivate skilled labor for the industry by promoting experiential training on the job.
- To motivate establishments to enroll apprentices by offering partial stipend support to them.
- To create up-skilling opportunities for candidates who have completed short-term skill training.
- To promote the enrollment of apprentices in small establishments (MSMEs) and those situated in underserved regions, such as aspirational districts and the North-East area.
- This scheme offers financial incentives to establishments that engage apprentices under the Apprentices Act, 1961.
- By providing partial stipend support and advocacy, the scheme encourages industries to develop a skilled workforce and bridge the gap between education and employment.
- The initiative not only fosters skill development but also emphasizes the creation of a trained workforce that meets industry demands.
- Candidates who finish their training are awarded a NAPS certificate, which boosts their employability.

National Apprenticeship Training Scheme

- It is one of the flagship programs of the Government of India aimed at skilling Indian youth in various trade disciplines.
- It operates under the provisions of the Apprentices Act, 1961, which was amended in 1973.

- It provides practical, hands-on On-the-Job-Training (OJT) based skilling opportunities for Graduate, Diploma students, and Vocational certificate holders.
- **Duration** - 6 months to 1 year.
- During the apprenticeship period, apprentices receive a stipend, 50% of which is reimbursable to the employer.

Reference

Business Standard | NAPS & NATS

One Liners 28-05-2025

Geography

Kiru Hydropower Project

The CBI has recently filed a chargesheet against the former Jammu and Kashmir Governor and five others, alleging irregularities in the ₹2,200-crore civil works contract for the Kiru hydropower project.

• **Type of Dam** – Gravity.

• **Project -** Kiru is a 624 MW run-of-river scheme on the Chenab River in Jammu & Kashmir's Kishtwar district, costing an estimated ₹4,287 crore.

• **Location -** Situated near the confluence of the Chenab with the Singad and Bela streams.

• **Design-** It features a 135m-high concrete gravity dam and an underground powerhouse with four 156 MW Francis turbines.

• **Strategic Positioning** - The project is being constructed between the existing Kirthai II (upstream) and Kwar (downstream) hydel power projects.

• **Development Consortium** - It is being developed by Chenab Valley Power Projects (CVPP), a joint venture of NHPC (49%), JKSPDC (49%), and Power Trading Corporation (PTC, 2%).

• **Significance -** Upon completion, the Kiru Hydropower Project is expected to provide crucial power to the northern Indian grid.

Polity & Governance

Film Undergoes 16 Cuts by CBFC

A film recently underwent 16 cuts by the Central Board of Film Certification (CBFC) due to caste-related dialogues and politically sensitive content before its release.

• **About the CBFC -** Is a **statutory body** under India's Ministry of Information and Broadcasting, often called the "Censor Board," though it primarily certifies films?

• **Operates under** - The Cinematograph Act, 1952.

• **Role and Structure** -The CBFC regulates public film exhibition in India; no film can be shown without its certification. It's led by a Chairperson and 12-25 government-appointed members, operating through nine regional offices. Advisory Panels assist in film examination.

• **Categories of Certification -** Films are certified as: **U** (Universal), **U/A** (Universal with parental guidance for under 12), **A** (Adults only), or **S** (Restricted to special categories).

• **CBFC -** It's a statutory body under the Ministry of Information and Broadcasting, responsible for certifying films for public exhibition in India.

• **Does CBFC Ban Films -** The CBFC can refuse certification if a film violates the Cinematograph Act, but a complete ban is typically a prerogative of the Central Government.

International Relations and Issues

Africa Day: Unity and Progress

Africa Day, celebrated annually on May 25th, commemorates the 1963 founding of the Organization of African Unity (OAU) in Addis Ababa, Ethiopia. It celebrates Africa's unity, diversity, and developmental strides.

• **Historical Context** - Initially African Freedom Day, it marks when 32 independent African states formed the OAU, later becoming the African Union (AU) in 2002.

• **Key Significance** - The day symbolizes overcoming colonialism, promotes Pan-Africanism, celebrates African identity, highlights progress, and encourages dialogue for continental solutions.

• **Celebrations Worldwide -** Observed with cultural performances, exhibitions, and discussions across Africa and by the global African diaspora.

• **Number of members -** 32 independent African states.

• **2025 Theme** - The African Union's 2025 theme is "Justice for Africans and People of African Descent through Reparations."

India Assumes Chairmanship of Asian Productivity Organization

India has officially assumed the Chairmanship of the Asian Productivity Organization (APO) for the 2025-26 term during the 67th Session of its Governing Body Meeting.

• **APO Established** - In 1961, headquarter is in Tokyo, Japan.

• **APO -** Is a regional intergovernmental organization dedicated to increasing productivity and sustainable socioeconomic development across the Asia-Pacific through mutual cooperation, policy advisory services, and capacity building.

• **Mission and Scope** - Acts as a think tank, undertakes smart initiatives in industry, agriculture, service, and public sectors, and assists member economies in formulating national productivity strategies.

• **It is nonpolitical** - nonprofit, and nondiscriminatory.

• Membership Membership is open to UN ESCAP member countries in Asia and the Pacific. Currently, 21 economies are members, including India, a founding member.

• **Headquarters and Structure** - The APO's headquarters are in Tokyo, Japan. Its structure comprises the Governing Body (the highest decision-making authority), National Productivity Organizations (NPOs), and the Secretariat.

Economy

India Becomes World's 4th Largest Economy

NITI Aayog CEO B.V.R. Subrahmanyam confirmed India has surpassed Japan to become the world's fourth-largest economy, citing IMF data.

• **The IMF World Economic Outlook (April 2025)** - Projects India's nominal GDP at $4.19 trillion, exceeding Japan's $4.18 trillion.

• **India's New Economic Status** - India is now the 4th largest economy, up from 5th in 2024. The new global ranking is: United States, China, Germany, India, and Japan.

• **Global Confidence Boost** - This achievement reinforces India's global economic power, attracting increased foreign direct investment and international collaborations.

• **Domestic Economic Growth** - India's GDP doubled from $2 trillion (2014) to over $4 trillion (2025), with per capita income rising from $1,438 to $2,880 in the same period.

• **Strategic Manufacturing Hub -** India maintains its position as a cost-effective production base, even amidst global reshoring discussions.

• **Future Potential -** NITI Aayog projects India to surpass Germany within 2.5-3 years, becoming the world's third-largest economy.

RBI Approves ₹2.69 Lakh Crore Surplus Transfer to Government

RBI's Dividend Transfer The Reserve Bank of India (RBI) has approved a ₹2.69 lakh crore surplus transfer to the Union Government as a dividend for the financial year 2024-25.

• **Dividends in Public Finance** - A dividend is a portion of profits returned to shareholders. For the RBI, the Government of India is the sole shareholder. These non-tax revenues help bridge fiscal deficits and are governed by the RBI Act, 1934.

• **Higher Surplus** - The significant 27% increase in surplus for 2024-25 (up from ₹2.10 lakh crore in 2023-24) is due to increased foreign exchange reserve sales (especially in January 2025), higher interest income from investments, and gains from forex transactions.

• **Economic Capital Framework (ECF)** - The transferable surplus was calculated based on the Revised Economic Capital Framework (ECF), approved on May 15, 2025, which ensures the RBI maintains sufficient capital to absorb financial shocks.

• **RBI Dividend** - It's the surplus profit the RBI transfers to the Central Government after covering its operational expenses and contingency provisions.

• **Legal Provision for Transfer** - The transfer is mandated under Section 47 of the RBI Act, 1934, which requires any surplus from RBI's operations to be transferred to the Government.

Environment

India's First Vistadome Jungle Safari Train Launched

Recently, Uttar Pradesh launched India’s first Vistadome jungle safari train, connecting Dudhwa Tiger Reserve and Katarniaghat Wildlife Sanctuary, boosting eco-tourism.

• **Aimed** - At integrating eco-tourism with rail travel, this "One Destination, Three Forests" initiative offers panoramic views, promoting biodiversity awareness and local employment.

• **Train Route -** The 107 km route connects Bichia (Bahraich) and Mailani (Lakhimpur Kheri).

• **Forests Covered** - The safari traverses Dudhwa National Park, Katarniaghat Wildlife Sanctuary, and Kishanpur Wildlife Sanctuary.

• **Vistadome Features** - Coaches boast rotating plush seats, large glass windows, and transparent rooftops for an immersive wildlife viewing experience.

• **Significance** - This pioneering initiative fosters environmental awareness through youth clubs and familiarization trips, creates local employment, and supports India's biodiversity conservation goals by reviving lesser-known forest reserves.

Nagshankar Temple: A Model for Turtle Conservation

World Turtle Day Recognition On World Turtle Day, Nagshankar Temple in Assam was officially recognized as a model temple for turtle conservation.

• **Location** - The temple is located in Biswanath district, Assam.

• **Historical Background** -Believed to have been built in the 4th century AD by King Nagashankar, it is dedicated to Lord Shiva and also reveres turtles as incarnations of Lord Vishnu.

• **Features** - The temple complex includes a large pond housing 250-300 turtles, including critically endangered black softshells, alongside peacocks, pythons, and deer.

• **Biodiversity Preservation** - The pond, fed by the Brahmaputra River basin, supports three rare species: **Black Softshell, Indian Softshell, and Malayan Softshell turtles.**

• **Community-Led Protection** - The Nagshankar Temple Committee collaborates with Turtle Survival Alliance (TSA) India, Help Earth, and Kaziranga National Park for conservation.

• **Scientific Intervention** - The forest department artificially incubates turtle eggs for wild release. This success has led to approximately 25 other temples across Assam, like Hajo’s Hayagriva Madhav Temple, becoming turtle conservation hubs.

Giant Shrimp *Alicella gigantea*

New findings reveal that the rare giant shrimp, *Alicella gigantea*, is far more widespread than previously thought, inhabiting 59% of the world's oceans.

• ***Alicella gigantea*** - This giant amphipod crustacean can reach up to 34 cm, making it one of the largest deep-sea amphipods known. Previously considered extremely rare, early sightings were often unidentified.

• **Taxonomy and Habitat** - *A. gigantea* thrives in deep-sea zones, including abyssal (3,000–6,000 m) and hadal (>6,000 m) depths, found as deep as 6,746 m in areas like the Murray Fracture Zone.

• **Global Distribution** - New research compiled 195 records from 75 locations across the Pacific, Atlantic, and Indian Oceans, establishing *A. gigantea* as a globally distributed species, not a rarity. The Pacific Ocean is its most significant habitat.

• ***Alicella gigantean* -** It is a species of deep-sea amphipod, notable for its large size and presence in the deepest parts of the ocean.

• **Habitat Depth -** This species inhabits depths ranging from 6,000 to 10,000 meters, making it one of the deepest-dwelling amphipods known.

Science

Novel Antimalarial Agents Target Mosquito-Stage Parasites

Mosura fentoni, New chemical compounds, was recently identified in a *Nature* study, target malaria parasites within *Anopheles* mosquitoes without harming the insect.

• **Key Compounds -** Endochin-like quinolones (ELQs) were identified. ELQ-456 completely blocks *P. falciparum* infection, while ELQ-331 significantly reduces it. Combinations like ELQ-453 + ELQ-613 prevent parasite maturation.

• **Mechanism of Action** - These agents specifically target the parasite during oocyst development in the mosquito, offering a non-insecticidal approach that bypasses typical insecticide resistance.

• **Features** - They are effective against insecticide-resistant mosquito strains, remain potent after a year of open-air exposure, work on contact, and are cost-effective to synthesize. They can also be safely incorporated into bed nets.

• **Limitations** - These agents are not yet commercially available, requiring further trials and regulatory approvals. Long-term misuse could induce parasite resistance, and initial infrastructure costs for new bed nets exist.

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