

Daily Current Affairs To The Point by Dhananjay Gautam

RAN

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GS Paper 3 – Environment, biodiversity, and climate change

Unveiling Thriving Ecosystems Beneath the George VI Ice Shelf: A Groundbreaking Discovery

Context: The **George VI Ice Shelf** is located in **George VI Sound**, nestled between **Alexander Island** and **Palmer Land**. It borders the **Bellingshausen Sea** in the Southern Ocean, a region rich in **floating ice shelves** and intricate underwater geography.



• **Governance**: Falls under the **Antarctic Treaty System**, with active research primarily led by the **UK** and the **USA**.

Key Discoveries from the Challenger 150 Initiative:

The **Challenger 150 Initiative** has revealed remarkable findings beneath the George VI Ice Shelf, changing our understanding of marine ecosystems in extreme conditions.

Thriving Deep-Sea Ecosystems:

- Scientists uncovered a variety of flourishing ecosystems, including large corals, sponges, icefish, and giant sea spiders.
- These ecosystems have **survived for centuries**, despite being isolated from sunlight and surface nutrients.
- The presence of complex life in such extreme conditions suggests **unknown nutrient transport pathways**, opening exciting new avenues for scientific exploration.

New Species Identified:

• Among the unique discoveries were **giant phantom jellyfish**, **octopi**, **vase-shaped sponges** (potentially centuries old), and **sea spiders**.

What Are Deep-Sea Ecosystems?

Deep-sea ecosystems refer to marine habitats located below **200 meters** in depth, primarily within the **aphotic zone**—a vast expanse comprising **90%** of Earth's marine environment. These ecosystems include:

- **Abyssal Plains**: These deep-sea plains host species like **sea cucumbers**, which rely on **marine snow**—organic particles that provide essential nutrients.
- **Hydrothermal Vents**: Rich in **chemosynthetic life**, such as **tubeworms** and **yeti crabs**, these ecosystems thrive in extreme conditions without sunlight.
- **Whale Falls**: The decaying bodies of whales create temporary, yet highly productive ecosystems, supporting creatures like **hagfish**.

Significance of the Discovery:

The findings under the **Challenger 150 Initiative** provide profound insights into marine science, challenging previous assumptions about life in extreme, nutrient-poor environments.

• Scientific Relevance: The discovery reshapes our understanding of life's resilience, proving that ecosystems can thrive without the expected nutrient sources.

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- **Climate Change Insights**: As **polar ice shelves** continue to melt due to **global warming**, these ecosystems may undergo drastic changes. Studying these deep-sea habitats offers crucial insights into how ecosystems might respond to **climate change**.
- **Marine Conservation**: The discovery underscores the urgency of creating robust **international frameworks** to protect the **fragile marine biodiversity** of the Southern Ocean.

International Cooperation & the Ocean Decade:

The **Challenger 150 Programme** is a key initiative within the **UN Decade of Ocean Science for Sustainable Development (2021–2030)**. This effort emphasizes the importance of **multilateral scientific collaboration** in deep-ocean exploration and conservation.

Endorsed by **UNESCO/IOC**, the initiative is aligned with global sustainable development goals, particularly **SDG 14 (Life Below Water)**, which aims to protect and restore marine ecosystems globally.

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India's Heat Action Plans Lack Long-Term Vision, Study Reveals

Context: A recent study has found that most **Heat Action Plans (HAPs)** in Indian cities lack **long-term strategies** to effectively combat **extreme heat**. Even cities with such plans face challenges in their **implementation**.

The report, titled **"Is India Ready for a Warming World? How Heat Resilience Measures Are Being Implemented for 11% of India's Urban Population in Some of Its Most At-Risk Cities,"** was conducted by the **Sustainable Futures Collaborative (SFC)**, a research organization based in New Delhi.



The study raises concerns that **insufficient planning** could lead to **more heat-related fatalities** as heatwaves intensify due to **climate change**.

Understanding Heat Action Plans (HAPs):

A Heat Action Plan (HAP) serves as an early warning and preparedness system designed to mitigate the impact of rising temperatures. These plans include both immediate interventions and long-term resilience strategies to protect vulnerable populations from heat-related health risks.

Key Components of Heat Action Plans:

Immediate Measures:

- Utilizing weather forecasts and early warning systems to alert authorities and the public.
- Conducting public awareness campaigns about heatwave dangers.
- Establishing cooling shelters and heat relief centres.
- Ensuring access to clean drinking water to prevent dehydration.
- Equipping **hospitals with necessary medical supplies** and training healthcare workers for heat-related emergencies.

Long-Term Strategies:

- **Urban planning solutions** such as increasing **tree cover** and **green spaces** to reduce heat.
- Using **heat-resistant building materials** to minimize the **urban heat island effect**.
- Implementing **cool roofing technology** to keep indoor temperatures lower.
- Enhancing **coordination among government agencies**, healthcare systems, and emergency responders for effective heatwave management.

Implementation of Heat Action Plans in India:

As of July 2024, the National Disaster Management Authority (NDMA) reported that HAPs are being implemented in 23 heatwave-prone states in partnership with state governments.

India's Escalating Heatwave Crisis:

Early Arrival of Extreme Heat:

- February **2024** witnessed **record-breaking temperatures**, with official **heatwave alerts in Goa and Maharashtra**.
- States like Odisha, Telangana, and Maharashtra recorded temperatures exceeding 40°C.
- **31 States and Union Territories** saw **night temperatures** at least **1°C above normal**, with **22 states/UTs** experiencing **3°C to 5°C** higher-than-usual temperatures.

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Rising Heatstroke Fatalities:

- Data from the NDMA reveals a worrying increase in heatstroke deaths, rising from 530 in 2020 to 730 in 2022.
- However, in **2024**, official reports indicated a decline, with **269 suspected** and **161 confirmed heatstroke deaths**.
- Contradicting this, the non-profit organization HeatWatch recorded 733 heat-related deaths across 17 Indian states between March and June 2024, raising concerns over data accuracy and heatwave preparedness.

Key Insights from the Study : The research identified **nine major Indian cities**, each with a population of over **one million**, expected to face **severe increases in dangerous heat levels**. The study was based on **88 interviews** with officials from **city, district, and state governments**, as well as representatives from **disaster management, healthcare, urban planning, and labor sectors**.

Major Findings:

- 1. **Short-Term Measures Exist**: All nine cities have emergency protocols, such as **access to drinking water** and **adjusted work schedules**, to tackle **immediate heat risks**.
- 2. Long-Term Planning is Lacking: Essential long-term solutions—including cooling solutions for vulnerable groups, insurance for lost wages, fire safety measures, and electricity grid upgrades—were either absent or poorly executed.
- 3. Uncoordinated Urban Planning Efforts: While efforts like expanding urban greenery are being made, they lack a focused strategy to help the most at-risk populations.
- 4. **Over-Reliance on Healthcare Solutions**: Most **long-term strategies** were geared toward **treating heatrelated illnesses**, rather than **preventing heat exposure** in the first place.
- 5. Institutional and Financial Challenges:
 - A lack of coordination between municipal, district, and state departments remains the biggest hurdle.
 - Limited funding is another major barrier to implementing sustainable heat resilience strategies.

The Need for a Comprehensive National Heat Strategy:

As global efforts to curb greenhouse gas emissions continue to lag, India must prioritize heat adaptation strategies.

Key Actions for a National Heat Strategy:

- Integrating **sustainable cooling solutions** like **green buildings**, **passive cooling techniques**, and **urban greening** into city planning.
- Avoiding over-reliance on **air conditioning**, which exacerbates **environmental damage** due to **ozone-depleting refrigerants**.
- Strengthening **national policies** to ensure that **heat resilience strategies** are **well-funded**, **well-coordinated**, **and effectively implemented**.
- Developing a **National Heat Strategy** as part of India's **National Adaptation Plan**, ensuring its inclusion in global discussions ahead of **COP30 in Brazil**.

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This study highlights the **urgent need for India** to move beyond **short-term emergency responses** and develop a **long-term, sustainable approach** to combat **rising heatwaves** and protect its **urban population**.

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GS Paper 2 – Governance, Constitution, Polity, Social Justice

Judiciary's In-House Inquiry & Removal of Judges in India: A Detailed Overview

Context: Chief Justice of India **(CJI) Sanjiv Khanna** has initiated an **unprecedented in-house inquiry** into Delhi High Court judge **Justice Yashwant Varma**. This follows an incident where **bundles of cash** were allegedly discovered at his residence after a fire broke out on **March 14, 2025**.

Unlike the **constitutional impeachment process**, this **in-house inquiry** is an internal mechanism for judicial accountability. A **three-member panel** has been formed to investigate the allegations. The inquiry panel comprises:



- Chief Justice G S Sandhawalia (Himachal Pradesh High Court)
- Justice Anu Sivaraman (Karnataka High Court)

How Can a Judge Be Removed in India?

Constitutional Provisions:

The process of removing a **Supreme Court judge** is governed by **Article 124(4)** of the **Indian Constitution**, while **Article 218** extends these provisions to **High Court judges**.

Grounds for Removal:

A judge can be removed only on two specific grounds:

- Prove<mark>n Misbeh</mark>aviour
- Incapacity

The Impeachment Process:

The **removal of a judge** follows a **strict parliamentary procedure**, which involves:

- 1. Impeachment Motion
 - A motion is introduced in either Lok Sabha or Rajya Sabha.
 - It requires the approval of **two-thirds of the members present and voting** in each House.
 - Additionally, the votes in favour must exceed **50% of the total membership** of that House.

2. Final Approval

- If both Houses approve, the **President of India** issues an order for removal.
- If Parliament is dissolved or its tenure ends before the process is completed, the **impeachment motion fails** automatically.

The In-House Procedure for Judicial Accountability:

Why Was an Internal Mechanism Needed?

The need for an internal disciplinary system arose after allegations of **financial misconduct** against **Bombay High Court Chief Justice A M Bhattacharjee** in **1995**. The Supreme Court, in the case **C. Ravichandran Iyer v. Justice A.M. Bhattacharjee (1995)**, observed that there was a gap between **bad behaviour** and **impeachable misconduct** under **Article 124**.

To address this, a **five-member committee** was formed to devise an **internal mechanism** for handling complaints against judges. The **Supreme Court adopted the procedure in December 1999**.

Revisions in 2014:

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In 2014, a **sexual harassment complaint** against a **Madhya Pradesh High Court judge** led the Supreme Court to further refine the **in-house inquiry process** in **Additional District and Sessions Judge 'X' v. Registrar General High Court of Madhya Pradesh**. Justices **J S Khehar and Arun Mishra** outlined a **seven-step process** for handling judicial misconduct.

How Does the In-House Inquiry Work?

Step 1: Receiving the Complaint

- Complaints can be **submitted to the CJI, a High Court Chief Justice, or the President of India**.
- The High Court Chief Justice or the President forwards the complaint to the CJI.
- If the CJI finds the complaint frivolous or baseless, it is dismissed.

Step 2: Preliminary Inquiry

- The CJI may request a preliminary report from the concerned High Court Chief Justice.
- If the preliminary findings suggest **serious misconduct**, the **CJI conducts a further review**.

Step 3: Formation of an Inquiry Committee

- If the **CJI determines a formal inquiry is necessary**, a **three-member committee** is formed.
- This typically includes:
 - Two Chief Justices of High Courts
 - **One Senior High Court Judge**
- The committee follows natural justice principles, ensuring the accused judge gets a fair opportunity to present their case.

Step 4: Conducting the Inquiry

- The committee investigates the allegations and submits a confidential report to the CJI.
- The report classifies the misconduct as:
 - Not serious enough for action
 - Serious enough to warrant resignation or removal

Step 5: Post-Inquiry Actions

- If the **misconduct** is **minor**, the **CJI may issue an advisory** to the judge.
- If the **misconduct is serious**, the **CJI advises the judge to resign or retire voluntarily**.
- If the judge **refuses to step down**, the **CJI can instruct the High Court Chief Justice to stop assigning them judicial work**.
- If the judge still does not resign, the CJI informs the President and the Prime Minister, recommending formal removal proceedings.

Why Is This Inquiry Significant?

The ongoing **in-house inquiry** against **Justice Yashwant Varma** demonstrates the Supreme Court's commitment to **judicial accountability** without needing a lengthy **impeachment process**. As a **precautionary measure**, **CJI Sanjiv Khanna has already directed Delhi High Court Chief Justice D K Upadhyaya to stop assigning cases** to Justice Varma.

This case highlights the **effectiveness of the in-house inquiry mechanism**, ensuring that judicial officers **uphold integrity** while maintaining the **independence of the judiciary**.

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GS Paper 1 – Geography

Places in News: Iran & Its Strategic Importance

Context: Iran's **Revolutionary Guards** have unveiled **new missile systems** on three strategically significant islands in the **Persian Gulf—Greater Tunb, Lesser Tunb, and Abu Musa**. These islands, located near the **Strait of Hormuz**, hold immense geopolitical importance as a major **global oil transit route**.

Political Overview of Iran:

Location & Borders:

Iran is situated in the Middle East, bordered by:

- South: Gulf of Oman and Persian Gulf
- North: Caspian Sea
- West: Iraq
- Northwest: Turkey
- North: Armenia & Azerbaijan
- East: Afghanistan & Pakistan
- Northeast: Turkmenistan

Strategic Significance:

- Strait of Hormuz: This crucial waterway handles one-fifth of the world's oil trade, making it a
 global flashpoint.
- Military Presence: Iran has frequently reinforced its military presence in the Persian Gulf to counter regional tensions.
- Energy Powerhouse: Iran holds the world's second-largest natural gas reserves and fourthlargest crude oil reserves.

Geographical Highlights of Iran:

Landforms & Terrain:

Iran's landscape is dominated by the Iranian Plateau, which features:

- Vast Deserts:
 - o Dasht-e Kavir (Great Salt Desert)
 - Dasht-e Lut (Lut Desert) (One of the hottest places on Earth)
- Mountain Ranges:
 - Zagros Mountains (West) A natural barrier between Iran and Iraq.
 - Alborz Mountains (North) Home to Mount Damavand (5,609 m), the highest peak in the Middle East.

Major Rivers:

- **Karun River** Iran's only navigable river, crucial for trade.
- **Safid River** Flows into the Caspian Sea, vital for agriculture. **Download Our Application**









Why Iran is in the Global Spotlight?

- **Energy Hub**: Iran's oil and gas reserves are critical for global energy security. •
- Military & Defense: Iran frequently upgrades its defense capabilities, leading to regional tensions.
- **Nuclear Controversy:** Its nuclear program remains a subject of international negotiations. •
- Geopolitical Influence: Iran plays a key role in Middle Eastern politics, often at odds with the U.S., Israel, and Gulf nations.

With Iran reinforcing its **military presence in the Gulf**, global powers are closely monitoring developments. The Strait of Hormuz remains a strategic chokepoint, where any conflict could have far-reaching economic consequences.





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GS Paper 3 – Environment, Ecology

Tackling Black Carbon: A Fast-Track Solution for Climate & Clean Air Benefits

Context: A recent report by the **Clean Air Fund** highlights that cutting down **black carbon**—alongside other **super pollutants**—is the **fastest** way to achieve **immediate climate gains** while simultaneously improving **air quality, public health, and economic growth**.

What is Black Carbon?

Black carbon, commonly known as soot, is a major component of fine

particulate air pollution (PM2.5). It is classified as a **Short-Lived Climate Pollutant (SLCP)**, remaining in the atmosphere for just **days to weeks**, yet exerting a **disproportionate warming effect**.

Major Sources of Black Carbon Emissions:

- Fossil Fuel Combustion (coal, diesel engines)
- **Biomass Burning** (wood, crop residue, wildfires)
- Industrial Processes (brick kilns, waste burning)

Top Global Emitters:

- China World's largest black carbon emitter
- India Second-largest emitter, with major contributions from biomass burning and diesel transport

The Alarmin<mark>g Impact</mark> of Black Carbon:

A Major Driver of Global Warming:

Black carbon is one of the key **super pollutants**, alongside **methane**, responsible for nearly **half of global warming**. Unlike CO_2 , which stays in the atmosphere for centuries, black carbon traps heat **immediately**, making its reduction a **quick-win strategy** for climate mitigation.

Regional Climate Disruptions:

- Accelerated Ice & Glacier Melting Black carbon deposits on snow and ice, reducing reflectivity and increasing melting rates. It accounts for **39% of mass loss in the Yala Glacier** (Tibetan Plateau).
- Monsoon Disturbances Disrupts Asian & West African monsoons, increasing risks of floods & droughts.

Public Health & Air Pollution:

- Causes **respiratory diseases**, heart conditions, and **premature deaths** due to toxic fine particulate pollution (PM2.5).
- Over **7 million** premature deaths annually are linked to **air pollution**, with black carbon being a significant contributor.

Key Solutions to Reduce Black Carbon:

• Target High-Impact Sectors in the Arctic – Curb emissions from gas flaring, shipping, and residential heating to protect fragile ecosystems.

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- Integrate Black Carbon Reduction into National Policies Countries must include black carbon targets in their clean air laws and climate strategies, especially in revisions of their Nationally **Determined Contributions (NDCs).**
- Strengthen Waste Management Systems Preventing open waste burning and improving solid waste disposal can significantly cut black carbon emissions.

The Takeaway:

Reducing black carbon offers a double benefit-an immediate slowdown of climate change and a significant improvement in public health. With rapid, coordinated action, we can make a real difference in both the climate fight and air pollution crisis.

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GS Paper 3 – Water Management & Sustainability

Farakka Barrage: 50 Years of Engineering Marvel & Water Diplomacy

Context: The **Farakka Barrage**, a key water infrastructure project on the **Ganga River**, marks **50 years of operation in 2025**. Since its commissioning on **April 21, 1975**, this massive structure has played a critical role in **water management**, **navigation**, **and India-Bangladesh river relations**.



About Farakka Barrage:

Location & Strategic Importance:

- Situated in Murshidabad district, West Bengal, just 18 km from the Bangladesh border.
- A key structure influencing **the hydrology of both India and Bangladesh**.

Construction & Commissioning:

- Built over **12 years** at a cost of **130 crores**.
- Officially operational since April 21, 1975.

Purpose & Functionality:

- Ensures smooth navigation for the Kolkata Port by flushing out silt from the Bhagirathi-Hooghly River.
- **Diverts 40,000 cusecs of water** into the **Farakka Feeder Canal** to maintain **Hooghly River flow**, especially during the **dry season**.
- Plays a crucial role in **India-Bangladesh water-sharing agreements**.

India-Bangladesh Water Agreements:

- **1977** Farakka Agreement First formal pact on Ganga water-sharing between India and Bangladesh.
- 1996 Ganga Water Treaty A 30-year agreement ensuring equitable distribution of Ganga waters, still in effect today.

Hooghly River & Its Significance:

Origin & Course:

- Also called **Bhagirathi-Hooghly or Kati-Ganga**.
- A 260 km-long distributary of the Ganga River.

The Ganga splits in Murshidabad, forming two rivers:

- **Padma River** Flows into Bangladesh.
- Hooghly River Flows through West Bengal into the Bay of Bengal.

Hydrology & Water Flow:

- Above Kolkata, the Hooghly River is heavily silted.
- The Farakka Feeder Canal supplies additional water, especially in the dry season.

Tributaries feeding the Hooghly include:

- Haldi River
- Ajay River

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- **Damodar River**
- **Rupnaravan River** •

Cities & Bridges Along the Hooghly River:

Major Cities on Its Banks:

- Jiagani •
- Azimganj
- **Murshidabad** •
- Baharampur
- Kolkata •
- Howrah •

Iconic Bridges Over Hooghly River:

- Howrah Bridge – A cantilever bridge linking Kolkata & Howrah, an engineering marvel.
- Bally Bridge Connects Bally & Baranagar, an important transport link. •

Why Farakka Barrage Matters?

- **Essential for Kolkata Port's Survival** Prevents silt buildup and maintains **navigability**.
- Key to Water Management Ensures a steady flow to Hooghly while balancing Bangladesh's needs. •
- Vital for Indo-Bangladesh Relations A focal point in water-sharing diplomacy between the two nations.

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