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Daily Current Affairs

To The Point

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GS Paper 2 – International Relation

1 The 51st G7 Summit: India's Rising Global Role and the Quest for Collective Solutions

Context: Prime Minister **Narendra Modi** participated in the **51st G7 Summit Outreach Session** held in **Kananaskis, Canada**, marking his **sixth consecutive appearance** at the prestigious global gathering. The summit served as a vital platform for **strategic dialogue**, bringing together world leaders to address some of the most pressing challenges of our time.

Theme of the 2025 G7 Outreach: Shaping a Resilient Future:

The **2025 G7 Outreach Summit**, hosted by **Canada**, focused on three pivotal themes:

- **Protecting Communities Across the World**
- **Building Energy Security and Accelerating the Digital Transition**
- **Securing Future Partnerships**

This summit also marked **50 years of G7 partnership and cooperation**, highlighting the evolution of this informal bloc into a cornerstone of **multilateral diplomacy**.

India's Strategic Engagement at the Summit:

PM Modi addressed a critical session on **'Energy Security: Diversification, Technology and Infrastructure to Ensure Access and Affordability in a Changing World'**. India emphasized its commitment to:

- Ensuring **affordable**, **reliable**, and **sustainable energy**
- Promoting the voice and concerns of the **Global South**
- Strengthening global cooperation on **green energy** and **technological transformation**

In addition to the multilateral meetings, PM Modi engaged in **bilateral discussions** with the leaders of **Germany, Canada, Ukraine**, and **Italy**, reinforcing India's global partnerships.

Understanding the G7: A Key Global Power Bloc

The **Group of Seven (G7)** is an **informal consortium** of the world's most advanced economies, consisting of:

- **Canada**
- **France**
- **Germany**
- **Italy**
- **Japan**
- **United Kingdom**
- **United States**
- **European Union** (as an observer)

Founded in 1975 in response to the global oil crisis, the G7 has since evolved into a leading platform for **coordinating economic and geopolitical policies**.

In **1998**, **Russia** was temporarily added, forming the **G8**, but was suspended in **2014** following the annexation of Crimea.

The G7 now represents about **10% of the world's population**, but nearly **30% of global GDP**.

India and the G7: A Steadily Growing Partnership

Although **not a formal G7 member**, **India** has been a **regular invitee** to the G7 Outreach Sessions since **2003**, and has attended **every year since 2019**.

As the **world's fifth-largest economy**, India's participation highlights its rising geopolitical stature and leadership in representing the **Global South**.

India contributes actively on issues such as:

- **Climate change**
- **Clean energy**
- **Digital inclusion**
- **Global health**
- **Geopolitical stability**

Why the G7 Summit Matters Globally:

1. **Economic Powerhouse**: G7 nations collectively wield immense **economic influence**, shaping global **trade**, **investment flows**, and **financial regulation**.
2. **Crisis Response Hub**: The group plays a crucial role in crafting **coordinated responses** to global crises, including **pandemics**, **financial shocks**, and **armed conflicts**.
3. **Catalyst for Climate and Innovation**: The G7 leads global initiatives on **climate policy**, **energy transition**, **AI governance**, and **technology frameworks**.
4. **Symbol of Multilateralism**: It remains a symbol of **rules-based international order**, consensus-building, and democratic cooperation.

Did You Know?

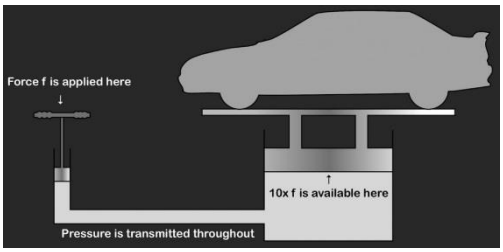
- The **first G7 summit** was hosted in **Rambouillet, France**, in **1975**.
- **Japan** will take over the presidency in **2026**, continuing the tradition of rotating leadership.
- The G7 does not have a **permanent secretariat**, making each presidency critical in setting the agenda.
- **India's inclusion** is often linked to its role as a **balancing power** between developed and developing economies.

Conclusion: A Platform of Promise and Partnership

The 51st G7 Summit reaffirmed the **power of dialogue**, **inclusivity**, and **shared responsibility**. With India playing an increasingly vital role, the summit demonstrated how global cooperation can be leveraged to build a **safer**, **greener**, and **more equitable world**. As we move into a future shaped by **energy transformation**, **digital innovation**, and **geopolitical flux**, forums like the G7 remain central to shaping a **collaborative global order**.

GS Paper 3 – Science & Technology

2 Hydraulic Systems: Powering Precision and Strength in Modern Engineering



Context: Hydraulic systems have revolutionized how we perform **heavy-duty tasks** across industries. By transforming energy into **smooth, controlled mechanical motion**, these systems make possible everything from lifting massive loads to executing intricate movements with **pinpoint accuracy**. With a global market worth over **$45–50 billion** and growing, hydraulics remain indispensable in the world of **advanced machinery**.

Understanding Hydraulic Systems: What Makes Them Work

- A **hydraulic system** uses **incompressible fluids** (usually oil) to **transmit force**. This principle enables **amplified power output** with minimal input, offering a **high power-to-weight ratio**, **efficient heat management**, and **precise control**. These systems are particularly vital in fields that demand **consistent and reliable mechanical force**.

The Science Behind It: Pascal's Law in Action

At the core of hydraulic operation is **Pascal's Law**, which states:

"Pressure applied to a confined fluid is transmitted undiminished in all directions."

In practice, this means that applying a small force on a small piston can generate a **much larger force** on a larger piston, thanks to the **uniform pressure distribution** in the fluid. This is what gives hydraulics their **incredible lifting power**.

In contrast, **pneumatic systems** use **compressible fluids** like air, making them suitable for lighter and faster operations, but generally **less powerful** than hydraulics.

Key Components of a Hydraulic System:

To deliver such efficient mechanical output, a hydraulic system is made up of the following **core components**:

- **Pump** – Converts mechanical energy into hydraulic energy by creating fluid flow.
- **Valves** – Direct, regulate, and control the flow and pressure of the hydraulic fluid.
- **Actuators (Cylinders or Motors)** – Convert fluid energy into **linear** or **rotary motion**.
- **Reservoirs and Pipes** – Store and transport the hydraulic fluid throughout the system.
- **Sensors and Control Units** – Monitor system performance and ensure **safety and responsiveness**.

Real-World Applications of Hydraulic Technology:

Hydraulic systems have become the **backbone** of many modern industries, thanks to their reliability and power:

- **Construction Machinery:** Used in **excavators**, **cranes**, **bulldozers**, and loaders to provide the **lifting**, **digging**, and **moving** capabilities essential on any construction site.

- **Aerospace and Aviation:** Aircraft utilize hydraulic systems in **landing gear**, **flaps**, **rudder control**, and **brake systems**, where **precise control** and **fail-safe operation** are non-negotiable.
- **Manufacturing and Automation**: Hydraulic presses, **injection molding machines**, and **robotic arms** rely on hydraulic power for repetitive, high-force operations that demand **speed and accuracy**.
- **Automotive Sector**: From **brake systems** in passenger cars to **hydraulic lifts** in service stations, these systems offer both **safety and functionality**.

Fun Fact: Hydraulics in Nature:

Hydraulic principles are even found in **nature**! For example, **spiders** use hydraulic pressure in their legs to extend and move swiftly—when they die, their legs curl up due to the loss of pressure!

Conclusion: The Future is Fluid-Powered

As industries continue to evolve toward **automation**, **precision**, and **energy efficiency**, **hydraulic systems** will remain at the forefront of innovation. Whether in **space exploration**, **smart manufacturing**, or **green energy solutions**, their unmatched capability to **control and amplify force** makes hydraulics an enduring foundation of **modern engineering excellence**.

GS Paper 3 – Environment & Ecology

3 India to Introduce Air Conditioner Temperature Guidelines for Energy Efficiency

Context: With temperatures soaring across the country, **air conditioners (ACs)** have become a household necessity in India. However, the unchecked use of ACs is significantly **increasing power demand**, straining the **national electricity grid** and the **environment**. In response, the Indian government is preparing to implement new **temperature guidelines** for ACs to promote **energy conservation** and **sustainable cooling**.

Rising Cooling Demand in India: A Growing Challenge

- **Cooling systems** currently account for nearly **50 GW**—or **20% of India's peak power demand**.
- With over **10 crore AC units** already in operation and **1.5 crore units** added each year, India is experiencing one of the **fastest-growing cooling demands** globally.
- Studies show that **every 1°C increase** in AC temperature setting can lead to approximately **6% energy savings**, showcasing the immense potential of optimized temperature regulation.

How Do Air Conditioners Work? Understanding the Cooling Cycle

An **air conditioner** works by transferring **heat from indoors to outdoors** using a **vapor-compression cycle**. This process relies on a **refrigerant fluid** and the interaction of four key components:

- **Evaporator** – Absorbs indoor heat and removes moisture.
- **Compressor** – Compresses vapor; it's the **most energy-intensive** part.
- **Condenser** – Releases the collected heat outside and condenses the vapor into liquid.
- **Expansion Valve** – Regulates pressure and temperature before recycling the refrigerant.

This entire cycle enables the AC to provide effective cooling—but at the cost of **significant electricity usage**.

Why Standardizing AC Temperatures Matters:

The **Bureau of Energy Efficiency (BEE)** has recommended a **default AC temperature setting of 24°C** in both residential and commercial buildings. This is based on scientific studies and **human comfort guidelines**:

- **Public spaces** often maintain ACs at **18–21°C**, which leads to **unnecessary energy consumption** and causes discomfort due to overcooling.
- According to global comfort standards, indoor temperatures up to **25°C** are **comfortable** when combined with **air circulation** and **moderate humidity**.
- The **World Health Organization (WHO)** advises maintaining indoor temperatures **above 18°C** to prevent health issues such as **respiratory illnesses**, **hypertension**, and **reduced cognitive function**.

Existing Challenges to Overcome:

Despite India's push toward energy efficiency, several **key issues** hinder progress:

- Only **20% of AC units** sold in India are **5-star rated**, meaning the majority are still **energy-inefficient**.
- BEE's **current rating standards** are outdated and need a **revamp by 2028** to meet global benchmarks.

- Implementation of the **Energy Conservation Building Code (ECBC)** remains **inconsistent**, especially in urban construction.
- There is limited use of **passive cooling techniques** like thermal insulation, natural ventilation, and reflective building materials.

The Way Forward: Strategies for Sustainable Cooling

To ensure that India's cooling future is both **eco-friendly** and **economically viable**, the government and stakeholders must work together on multiple fronts:

Promote Passive Cooling Architecture

Encourage **climate-responsive building designs** that include:

- **Cross-ventilation**
- **Shaded facades**
- **Cool roofs** and **green cover**
- **Thermal mass insulation**

Conclusion: Regulating to Refresh India's Cooling Future

In a country like India, where **climate change** and **urbanization** are intensifying the need for cooling, **air conditioners** are no longer a luxury—they are a necessity. However, without regulation, their **energy footprint** could become unsustainable.

GS Paper 3 – Environment & Ecology

4 Kerala High Court Cracks Down on Single-Use Plastics in Ecologically Fragile Hill Stations

Context: In a **landmark move**, the **Kerala High Court** has enforced a **ban on single-use plastics** in **ecologically sensitive hilly tourist destinations** across the state. This decisive action also includes the **regulation of plastic bottle usage** during **mass gatherings** such as weddings, public celebrations, and **government-sponsored events**.

Importantly, the court has **excluded non-woven polypropylene bags** with a thickness of **60 GSM and above** from this ban, recognizing their **reusability and relatively lower environmental footprint**.

Why This Ban Matters: The Environmental and Public Health Impact

Hilly regions are **environmentally delicate ecosystems**. Plastic pollution in these areas has far-reaching consequences:

- **Biodiversity Threat**: Plastic debris contaminates soil and water, threatening **native flora and fauna** and **disrupting local food chains**.
- **Public Health Risks**: Stagnant plastic waste encourages **mosquito breeding**, leads to **water contamination**, and **diminishes the visual appeal** of scenic tourist spots.
- **Climate Vulnerability**: Plastics contribute to **microplastic contamination** and disrupt **carbon sinks** like forests and mountain soil.

The Real Challenge: Waste Governance in Mountain Terrains

Despite repeated attempts, managing waste in hilly regions remains a tough challenge due to:

- **Lack of Local Infrastructure**: Most hill towns **lack basic facilities** for waste segregation, collection, and disposal.
- **Weak Enforcement**: Though plastic bans exist in theory, in practice, there is **poor monitoring**, **low compliance**, and **limited alternatives** available for **local vendors and tourists**.
- **Low Awareness**: **Tourists often overlook** sustainable practices, and many businesses **lack awareness of their responsibilities** under **Extended Producer Responsibility (EPR)** regulations.
- **Geographic Isolation**: **Scattered settlements**, **steep terrain**, and **seasonal inaccessibility** make logistics complex and costly.

India's Broader Push Against Plastic Pollution:

Kerala's initiative aligns with **India's national strategy** to tackle the growing plastic menace:

- **Extended Producer Responsibility (EPR)**: Makes **plastic producers accountable** for post-consumer waste management.
- **Plastic Waste Management (Amendment) Rules, 2022**: Bans the use of plastic bags thinner than **120 microns** to reduce litter and increase recyclability.
- **Swachh Bharat Abhiyan**: A national mission focusing on **cleanliness and waste segregation**, including **plastic collection drives** in both urban and rural areas.
- **Plastic Parks**: India has established **dedicated zones** for **recycling and reprocessing plastic waste**, promoting **circular economy principles**.

- **Judicial Activism**: Indian courts, invoking **Article 21** (Right to Life), have increasingly intervened in cases of **environmental degradation**, reinforcing the **legal right to a clean and healthy environment**.

The Way Forward: Building a Sustainable, Mountain-Friendly Future

To protect India's fragile mountain ecosystems, a **multi-pronged strategy** is essential:

- **Tailored Waste Policies**: Formulate regulations that respect **local customs**, **geographic limitations**, and **ecological importance** of hill areas.
- **Community-Led Waste Management**: Encourage **decentralized, low-cost systems** rooted in **traditional practices** and **local governance**.
- **Eco-Tourism Mandates**: Implement **mandatory waste audits**, **zero-waste event protocols**, and **tourist education drives**, especially near **pilgrimage sites and water bodies**.
- **Green Incentives**: Offer **incentives for businesses** and tourists adopting sustainable practices — such as discounts for reusable containers or recognition programs for plastic-free accommodations.

Additional Insight: Global Parallels and Lessons

Countries like **Nepal and Bhutan** have also faced plastic waste crises in their mountainous regions. For instance:

- **Bhutan**, known for its **Gross National Happiness model**, banned plastic bags in 1999 and promotes **eco-tourism as a national policy**.
- In **Switzerland**, mountain resorts employ **underground waste suction systems** to minimize visual and environmental impact.

Kerala's new ban could serve as a **model for other Indian states** with hilly terrains such as **Himachal Pradesh, Uttarakhand, and Sikkim**, helping the country collectively move toward a **plastic-free and sustainable future**.

Conclusion: A Step in the Right Direction

The **Kerala High Court's intervention** is a timely reminder that **sustainable development** must respect **environmental limits**, especially in **climate-sensitive zones**. As plastic pollution continues to escalate, especially in tourist hotspots, **proactive legal measures**, **community engagement**, and **eco-conscious tourism** are no longer optional — they are imperative.

GS Paper 1 – Geography

5 Croatia in Focus: A Strategic European Partner in the Spotlight

Context: Croatia, a picturesque country nestled in **South-Eastern Europe**, has recently gained attention following a **high-level visit by the Prime Minister of India**. This visit marks a significant step in bolstering **bilateral relations**, particularly in the realms of trade, tourism, defence, and cultural exchange.

Political Ladscape: A Key Player in the Balkans

Situated on the **Balkan Peninsula**, **Croatia shares its borders** with five countries:

- **Hungary to the north**
- **Montenegro to the south**
- **Slovenia to the west**
- **Serbia and Bosnia & Herzegovina to the east**

With its **capital in Zagreb**, Croatia is a **member of both the European Union (EU) and the North Atlantic Treaty Organization (NATO)**. This dual membership underscores its strategic position in European security and economic networks.

Croatia joined the **EU in 2013**, becoming the **28th member**, and adopted the **Euro as its official currency in January 2023**, replacing the Croatian Kuna.

Geography and Climate: A Diverse Natural Landscape

Croatia boasts a stunning geographical mix that includes:

- **The Dinaric Alps**, a prominent mountain range running parallel to the Adriatic coast.
- A **long, scenic coastline along the Adriatic Sea**, featuring over **1,000 islands**, making it a hub for European tourism.
- Major rivers such as the **Sava** and **Drava**, which play vital roles in agriculture, transport, and hydropower.

The nation experiences two distinct climate zones**:**

- **Continental Climate**: Characterized by **hot summers and cold winters**, especially in inland areas like Zagreb.
- **Mediterranean Climate**: Along the coast, the weather remains **mild and sunny**, attracting millions of tourists every year.

Additional Insights: Croatia's Global Relevance

- Croatia has a **high Human Development Index (HDI)** and is known for its **excellent healthcare and education systems**.

- The country is famous for its **cultural heritage**, including **UNESCO World Heritage Sites** like the **Old City of Dubrovnik**, often referred to as the "Pearl of the Adriatic".
- It has made a name for itself in sports, particularly in **football**, with the national team finishing **second in the 2018 FIFA World Cup**.

Conclusion: Strengthening Partnerships Across Continents

Croatia's strategic location, **EU-NATO membership**, and **cultural ties with both Western and Eastern Europe** make it an important player on the international stage. India's recent diplomatic outreach signals a **growing partnership rooted in mutual interests**, from **economic cooperation to global security**.

As the world continues to shift toward **multi-polar global alliances**, engaging with nations like Croatia will be essential for India's expanding global footprint.

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

6 Bihar Pioneers E-Voting for Urban Elections: A Leap Towards Digital Democracy

Context: In a groundbreaking move towards **digitizing the electoral process**, **Bihar is set to become the first Indian state to introduce mobile-based e-voting** in its upcoming **urban local body elections**. This innovative initiative by the **Bihar State Election Commission** is poised to transform how citizens engage with the democratic process, making voting more **accessible, secure, and user-friendly**.

The **e-voting system**, scheduled for rollout later this month, will allow voters to cast their ballots through **Android-based mobile applications**—a major milestone in India's journey toward **electoral modernization**.

Key Features of Bihar's E-Voting System:

1. **Mobile-Based Voting:** The system uses two specialized **Android apps**—one developed by the **Centre for Development of Advanced Computing (C-DAC)** and the other by the **Bihar State Election Commission**. The apps will be available for verified voters to cast their votes remotely.
2. **Advanced Security Protocols:** Security is at the heart of this system. It incorporates:
   - **Blockchain technology** to ensure **tamper-proof data storage**
   - **Liveness detection** to verify that a real person is casting the vote in real time
   - **Facial recognition and matching** to confirm the voter's identity, including **live scans and photo comparisons**
3. **Transparent Audit Mechanism:** Like the **VVPAT system used with EVMs**, Bihar's e-voting platform will maintain an **audit trail**, enabling **vote tracking and verification**. This ensures **accountability and transparency**, boosting public trust in the system.

Why E-Voting Matters: The Advantages

1. **Greater Accessibility:** This system empowers traditionally underrepresented groups such as:
   - **Migrant workers**
   - **Senior citizens**
   - **Persons with disabilities**
   - **Voters living in remote or urban-transit areas**
2. **Youth Engagement:** With **India's youth making up over 50% of the electorate**, mobile e-voting appeals to their **digital fluency**, encouraging **first-time voters** to participate and build a **lifelong habit of voting**.
3. **Boosting Voter Turnout:** By eliminating the need to travel to polling booths, this system could significantly **increase voter turnout**, especially in urban areas where daily life is fast-paced and often mobility-restricted.
4. **Eco-Friendly Option:** E-voting can potentially reduce the use of **paper ballots, printed lists**, and **manual resources**, making elections more **sustainable and cost-efficient** over time.

Challenges and Concerns:

Despite its promise, e-voting raises several valid concerns:

- **Cybersecurity Risks:** Vulnerabilities to **hacking, data breaches**, and **system manipulation** remain key issues.
- **Digital Divide:** Those without smartphones, internet access, or digital literacy—often the **elderly and rural poor**—may face exclusion.
- **Coercion and Privacy Issues:** Voting from home or shared spaces may compromise the **secrecy and freedom** of individual choices.
- **Legal and Logistical Readiness:** There's a need for **clear legal frameworks**, **robust grievance redressal systems**, and **voter education campaigns** to support this shift.

Global Context: E-Voting Around the World

Countries like **Estonia** have already successfully implemented **nationwide internet voting** (i-voting) since 2005, with robust security protocols and high public trust. **Switzerland** and **Canada** have also experimented with online voting in select regions. Bihar's step aligns with **global trends** in making elections **digital, inclusive, and forward-looking**.

Conclusion: A Bold Step Towards Electoral Innovation

Bihar's adoption of mobile-based e-voting is a **historic initiative** that could serve as a **blueprint for the rest of the country**. If implemented effectively, it can **revolutionize the electoral landscape** by making it more **inclusive, efficient, and future-ready**.

However, the real test lies in ensuring **cybersecurity, accessibility, and voter confidence**. With the right safeguards, Bihar's model could herald a new era of **digital democracy in India**, where every eligible citizen has the **power to vote anytime, anywhere—securely and confidently**.