

FINDER

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The strategic vulnerability in India's LPG supply model

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 3
Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

1. India's LPG Demand–Supply Mismatch

- India consumes about **33.15 million tonnes of LPG**, but **domestic production meets only 40%**.
- Around **60% of LPG is imported**, showing heavy **import dependence**.
- Total demand is about **250% of domestic production**, a major structural gap.
- LPG is mainly used for **household cooking (over 90%)**, making demand **non-flexible**.

2. Strategic Vulnerabilities

- About **90% of LPG imports pass through the Strait of Hormuz**, a **geopolitical risk zone**.
- Any disruption affects **household energy security**, not just industry.
- LPG imports are not easily replaceable due to **limited global export supply**.

3. Comparison with Other Countries

- Japan** imports more LPG but is less vulnerable due to:
 - ➔ **Energy diversification** (electricity, city gas)
 - ➔ **High storage capacity (108 days)**
- China & South Korea** use LPG more in **petrochemicals**, not households.
- India is more exposed because LPG is **concentrated in household use** with **limited alternatives**.

4. Solutions & Policy Measures

- Prioritise domestic LPG** for household consumption over industrial use.
- Build larger **strategic storage reserves** (target: **2–3 weeks buffer**).
- Promote **electric cooking** and expand **PNG (Piped Natural Gas)**.
- Reduce dependence by **diversifying energy sources** in households.
- Separate **petrochemical demand** from household LPG supply.

The price of a war far above the ground

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1. Immediate Impact of Conflict on Aviation

- Airspace closures (West Asia)** have forced **longer flight routes (2–8 hours extra)**.
- Fuel consumption has increased**, raising operational costs.
- Jet fuel prices surged (\$195-197/barrel)**, heavily impacting airlines.
- Ticket prices increased (10-20%)** and **fuel surcharges rose (>30%)**.
- Flight cancellations** increased, especially on **Europe-Asia routes**.

2. Structural Changes ("New Normal")

- Temporary rerouting may become a permanent **operational reality**.

- Airlines face **higher long-term costs** (fuel, crew, time, utilisation).
- Airlines may **cut less profitable long-distance routes**.
- Possible **shift in global aviation hubs** (away from West Asia).
- **Indian airlines are more vulnerable** due to dependence on **West Asian corridors**.

3. Risks of Escalation

- Further conflict may cause **wider airspace closures** and **fuel price volatility**.
- Could lead to **system-wide disruption** in global aviation.
- **Flight networks may contract** and **demand may fall** due to high fares.
- Unlike COVID-19, this is a **cost-driven crisis**, not demand collapse.

4. India-Specific Challenges & Opportunities

- **ATF (Aviation Turbine Fuel)** already heavily taxed → worsens cost pressures.
- Combined impact of **high costs + weak demand + limited ability to raise price**.
- Risk of **airline consolidation or financial stress**.
- Opportunity to:
 - ➔ **Diversify routes** and reduce geopolitical dependence
 - ➔ **Invest in aircraft that can fly very long distances without stopping**.
 - ➔ Develop **India as an alternative aviation hub**
 - ➔ Reform **ATF taxation and aviation policies**

U.S. power, Latin American resistance

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 2
Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.

1.Context

- The **U.S. under Donald Trump has adopted a coercive Latin America policy, involving military actions, sanctions,** and economic pressure.
- This reflects continuity with past interventions, such as the Cold War-era regime changes.
- The U.S. backed coups like the 1973 **overthrow of Salvador Allende in Chile and the removal of Jacobo Árbenz in Guatemala to secure strategic interests**.
- Historically, such actions were justified under the Roosevelt Corollary, which legitimised U.S. intervention as a form of "international policing."

The Roosevelt Corollary is a U.S. foreign policy principle announced in 1904 by Theodore Roosevelt, stating that the **United States had the right to intervene in Latin American countries in cases of "chronic wrongdoing"** to maintain stability and protect its interests, acting as an "international police power."

- These **interventions triggered anti-imperialist resistance and political mobilisation**, shaping Latin America's long-term distrust of U.S. influence.

2. Roots of Anti-Imperialism in Latin America

- The **U.S. in the early 20th century repeatedly occupied Latin American countries** (Cuba, Haiti, Nicaragua), ignoring sovereignty.
- Interventions **were justified by the Roosevelt Corollary**.
- This period **saw a strong anti-imperialist political awakening**.
- Movements arose across cities (Buenos Aires, Mexico City, Havana, and Lima), led by students, workers, and left groups.
- **Groups like Veracruz Peasant League (1923)** opposed U.S. imperialism.
- Ideas were shaped by the Mexican Revolution and Russian Revolution.

3. Mexico City as the Nucleus of Latin American Anti-Imperialist Movements

- Mexico City became **the central hub where diverse anti-imperialist movements converged and coordinated**.

- **Organisations like APRA (American Popular Revolutionary Alliance)** united under the Anti-Imperialist League of the Americas (1925).
- Julio Antonio Mella (Cuban student leader) argued the U.S. was an informal empire, using economic dominance.
- **Ricardo Paredes (Ecuadorian founder of Socialist Party)** conceptualised Latin American nations as **“dependent countries”**; politically sovereign but structurally subordinated.
- The need for regional unity against a common imperial power (U.S.) was raised.

4. Divergences and Legacy of Anti-Imperialist Movements in Latin America

- Latin American **anti-imperialist movements showed ideological diversity, with disagreements on strategy.**
- These **differences led to deep divisions: revolutionaries vs reformists, nationalists vs internationalists, pro- vs anti-communists.**
- Such rifts originated in the interwar period, later shaping Cold War politics in the region.
- The **1920s–30s anti-imperialist wave politicised a generation of leaders**, influencing later revolutions.
- Historically, **U.S. intervention has triggered counter-mobilisation**, suggesting current assertiveness may revive anti-imperialist movements.

From light waves to quantum physics: the science behind smart washbasins

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 3
Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

1. Context

- **Automatic systems in public spaces like multiplexes, airports, and metro stations appear “magical” as they respond instantly to human presence**, creating an illusion of intelligence.
- These touch-free technologies (taps, doors, escalators, sanitizers) enhance convenience and hygiene in everyday life.

- Their **functioning is based on invisible light and sensors**, similar to the mechanism used in TV and AC remotes.

2. Understanding Waves and Light

- A **wave is a moving disturbance that transfers energy.**
- **Frequency** determines how fast a wave oscillates.
- Light is a type of electromagnetic (EM) wave.
- Unlike sound, **light can travel through a vacuum.**
- Only a small range of EM waves is visible to humans (visible light: around 400–800 terahertz).

3. Invisible Infrared (IR) Light

- Infrared waves have slightly lower frequency than red light, so they fall outside the visible range and **cannot be seen by human eyes.**
- Devices like **remotes use IR LEDs to emit signals.**
- Though invisible, **IR can sometimes be detected using smartphone cameras.**
- All objects (including human bodies) emit IR radiation.

4. How Remotes and Sensors Work?

- **Remotes send IR signals using an LED** (Light Emitting Diode).
- Devices (TV/AC) contain **photodiodes (sensors) that detect this IR light.**
- When IR light hits the sensor, it allows electric current to flow, turning the device ON.
- Sensors are designed to respond only to specific signals, preventing interference between devices.

5. How Automatic Washbasins Detect Hands?

- An IR LED and sensor are placed near the tap.
- When a hand is placed:
 - ➔ It **reflects IR light back to the sensor.**
 - ➔ The **sensor detects this and activates the water flow.**
- This is similar to light reflecting off a mirror into your eyes.

KEYWORDS

Biogenic carbon

- Biogenic carbon **refers to carbon that is absorbed, stored, and released by living organisms (biomass)** such as plants **through natural processes** like photosynthesis and decomposition.
- Unlike fossil carbon, **biogenic carbon operates within the short-term natural carbon cycle**, where carbon released during combustion or decay was recently absorbed from the atmosphere.
- In carbon accounting, **biogenic carbon emissions are reported separately from fossil fuel emissions to ensure transparency** in greenhouse gas inventories.
- Biogenic carbon is **often treated as 'carbon-neutral'** because the **CO₂ emitted during biomass use can be reabsorbed by regrowing vegetation**, provided sustainable practices are followed.

Forest Survey of India (FSI)

- The **Forest Survey of India (FSI)** is a **premier national organisation** under the **Union Ministry of Environment and Forests**, responsible for the **regular assessment and monitoring of forest resources** in India.
- It also undertakes **training, research, and extension services**.
- Established on **June 1, 1981**, FSI replaced the **Preinvestment Survey of Forest Resources (PISFR)**, which was launched in **1965** with support from **FAO** and **UNDP**.
- The **National Commission on Agriculture (1976)** recommended the creation of a **national-level forest survey body** to ensure **systematic and periodic forest resource assessment**, leading to the formation of FSI.
- In **1986**, the **Government of India revised FSI's mandate** to align it with the **evolving needs and priorities** of the country.

