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1. Suez Canal Economic Zone (SCZone)

- Prelims Suez Canal Economic Zone (SCZone)
- Mains GS 2 International Relations

Why in the news?

• The Egyptian Foreign Minister has proposed that India shall consider joining the Suez Canal Economic Zone.

Suez Canal Economic Zone (SCZone)

• What is it?: The SCZone is a specially designated economic region in Egypt, established along both banks of the Suez Canal, created to attract investment, industrial development, logistics, trade and export-oriented manufacturing.

• Strategic Significance:

- → Located on one of the world's busiest maritime trade routes, linking Asia, Africa, and Europe.
- → Acts as a gateway for trade between East and West, providing quicker access to key global markets.
- → Supports Egypt's geopolitical and economic influence in the region.

• Key Features:

- → Location & scale: The zone runs along the Suez Canal corridor, covering multiple industrial zones, ports and logistic hubs.
- → Ports & infrastructure: SCZone offers access to multiple seaports (six ports are cited) and at least two airports.
- → Incentives: Investors in SCZone benefit from preferential regulations, tax/investment incentives, streamlined administrative procedures.
- → Industry & sectors: Intended to host light and heavy manufacturing, logistics, trade hubs, export processing, energy & green fuels, services. For example, solar module export facilities are being developed.
- → **Regulatory framework:** Regulatory framework established under a legislation of Egypt.



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• Significance for India:

- → The Suez Canal handles ~12% of global trade and for a country like India, joining the SCZone means access to a strategic manufacturing/logistics hub bridging Asia, Africa, Europe.
- → It adds diversification of investment opportunities: beyond just import/export, into value-added manufacturing, re-exports, regional trade.
- → Participation can deepen bilateral/trilateral cooperation (e.g., through combined industrial complexes, supply-chain linkages, port-logistics tie-ups).
- → The SCZONE enhances India—Egypt cooperation in trade, manufacturing, and maritime security.
- → Strengthens India's efforts in increasing engagements with the African Union.

• Challenges:

- → Geopolitical/logistics risks (e.g., shipping disruptions, regional instability) can affect the zone's attractiveness despite its strategic location.
- → The SCZone already hosts industrial complexes from China, Russia, and Gulf countries. India may face strategic competition or reduced influence compared to entrenched players aligned with their own blocs.
- → Integrating SCZone participation within India's IMEC vision may require complex coordination with Western, Arab, and Mediterranean partners to avoid duplication or conflict of interest.
- → Return on investment (ROI) uncertainty
- → Egypt has faced currency depreciation, inflation, and IMF-linked fiscal reforms, which could raise costs or erode profitability.
- → Although SCZone is a "special regime," overlapping national laws, customs processes, or approval layers can delay project execution.

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2. Graded Response Action Plan (GRAP)

- **Prelims -** Graded Response Action Plan (GRAP)
- Mains GS 3 Environment

Why in the news?

 CAQM invoked the 12-point action plan under Stage-II of the current Graded Response Action Plan (GRAP) across the entire National Capital Region (NCR) with immediate effect.

Graded Response Action Plan (GRAP)

• What is it?: The Graded Response Action Plan (GRAP) is a pre-emptive and emergency framework designed to control and reduce air pollution levels in the Delhi-NCR region by introducing graded sets of measures that are triggered automatically based on Air Quality Index (AQI) levels.

• Objectives:

- → To prevent further deterioration of air quality once it crosses threshold levels.
- → To ensure coordinated and time-bound action among agencies.
- → To make pollution control measures predictable, science-based, and incremental.

• Institutional Framework:

- → Legal Basis: Directed by Supreme Court under M.C. Mehta case (2016).
- → **Notification:** By Ministry of Environment, Forest & Climate Change (MoEFCC) in 2017.
- → Implementing Authority: CAQM (replacing EPCA in 2020 under Commission for Air Quality Management in NCR and Adjoining Areas Act, 2021).
- → Technical Support: Indian Institute of Tropical Meteorology (IITM) and India Meteorological Department (IMD) provide AQI and meteorological forecasts.

• Implementation Mechanism:

- → Supervisory Body: CAQM (under MoEFCC).
- → Executing Agencies: State Pollution Control Boards, CPCB, municipal corporations, transport & traffic departments.





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- → Sub-Committee on GRAP: Meets frequently to monitor real-time data and issue orders as per AQI forecasts.
- → Orders of CAQM override state-level directions when there is a conflict.

• Significance:

- → Provides a scientific, graded framework for pollution control.
- → Enhances accountability among multiple agencies.
- → Enables pre-emptive action during winter months when pollution peaks.
- → Promotes inter-state coordination in NCR, covering Delhi, Haryana, Uttar Pradesh, and Rajasthan.

• Challenges:

- → Implementation gaps and weak enforcement at the ground level.
- → Lack of permanent measures addressing root causes (vehicular emissions, stubble burning, industrial waste management).
- → Coordination issues among multiple state agencies.

• **GRAP Updations:**

- → Revised GRAP (2023 onwards) now includes forecast-based early implementation- Measures can be triggered three days in advance if deterioration is anticipated.
- → Includes focus on green fuels, waste management, and real-time AQI public disclosure.

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3. Nauru

- Prelims Location of Nauru
- Mains GS 1 Geography

Nauru



Why in the news?

 Australia has defended its A\$2.5 billion, 30-year agreement with Nauru to resettle deported noncitizens, a move criticised by human rights groups who allege it shifts refugee responsibility to smaller, aid-dependent Pacific nations.

<u>Nauru</u>

- Location: Nauru is an island nation and a microstate in Oceania, located in the southwestern Pacific Ocean.
- **Capital**: It has no official capital city but Yaren is the de facto capital of Nauru.
- Fact: It is the smallest republic in the world.
- **Border**: The island is about 1,300 km northeast of the Solomon Islands; its closest neighbour is the island of Banaba, in Kiribati.
- Geography: The island is dominated by a central phosphate plateau which is surrounded by coral cliffs.



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4. Chandrayaan-2 Mission and Coronal Mass Ejection (CME)

- Prelims Chandrayaan-2 Mission and Coronal Mass Ejection (CME)
- Mains GS 3 Science and Technology

Why in the news?

• Chandrayaan-2 has made the first-ever observation of the effects of the Sun's Coronal Mass Ejection (CME) on the Moon.

Chandrayaan-2 Mission

- Launched by: Indian Space Research Organisation (ISRO)
- Launch date: 22 July 2019
- Launch vehicle: GSLV Mk-III-M1 (Geosynchronous Satellite Launch Vehicle)
- Mission type: India's second lunar exploration mission
- <u>Aim</u>: To explore the south polar region of the Moon, a largely uncharted area, and to study lunar topography, mineralogy, and exosphere.

• Scientific Objectives

- → Lunar topography: Map surface features and craters.
- → Mineralogy: Study mineral and elemental composition.
- → Exosphere: Analyze the thin lunar atmosphere.
- → Water-ice detection: Assess the distribution of hydroxyl and water molecules near the south pole.
- → Surface composition: Map Mg, Al, Si, Ca, Fe, Ti abundances using X-ray and infrared spectrometers.

• Mission Components

- → Orbiter:
 - ★ Provides high-resolution imaging and mineral mapping.
 - ★ Lifespan: ~7 years.

→ Vikram Lander

★ Aimed for soft landing near south pole.

→ Pragyan Rover

- ★ Six-wheeled robotic vehicle carried inside Vikram.
- ★ Could not operate due to failed landing.



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• Significance

- → First attempt to land near lunar south pole.
- → Demonstrated India's advanced space engineering and deep-space communication capabilities.
- → Data from orbiter continues to aid Chandrayaan-3 (2023) and global lunar studies.

Coronal Mass Ejection (CME)

• <u>Definition</u>: A Coronal Mass Ejection (CME) is a massive burst of plasma and magnetic field released from the Sun's outer atmosphere (the corona) into space.

• Origin

- → CMEs occur during solar flares or from active magnetic regions on the Sun.
- → They are caused by the sudden release of magnetic energy when twisted magnetic field lines reconnect and eject solar material.

• Effects

- → **Geomagnetic Storms**: Disturb the Earth's magnetic field, cause auroras, and may disrupt satellites, GPS, radio networks, and power grids.
- → Radiation Hazards: Increase radiation levels harmful to astronauts and high-altitude flights.
- → Space Weather Impact: Influence communication systems, navigation, and even pipeline currents on Earth.

• Monitoring and Prediction

- → NASA missions: SOHO, STEREO, Parker Solar Probe.
- → ISRO mission: Aditya-L1 monitors solar corona and CME activity.
- → NOAA's SWPC: Issues global space weather alerts.

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5. Women Entrepreneurship Platform and We Rise Initiative

- **Prelims** Women Entrepreneurship Platform and We Rise Initiative
- Mains GS 2 Social Justice

Why in the news?

 NITI Aayog's Women Entrepreneurship Platform (WEP) and DP World have jointly launched the initiative 'We Rise- Women Entrepreneurs Reimagining Inclusive and Sustainable Enterprises'.

Women Entrepreneurship Platform

- <u>Launch:</u> The Women Entrepreneurship Platform (WEP) is a flagship initiative by NITI Aayog, launched on 8 March 2018, following its announcement at the 8th Global Entrepreneurship Summit (2017) in Hyderabad.
- Aim: It serves as a unified access portal to promote and support women entrepreneurship across India, bridging gaps in information, finance, and mentorship.
- **Vision**: The platform embodies the vision "Women First, Prosperity for All" and aims to make women-led development a reality.

• Objectives:

- → Promote inclusive and women-led entrepreneurship in India.
- → Provide end-to-end support through mentorship, financial literacy, legal guidance, and networking.
- → Create a vibrant ecosystem for growth and sustainability of women-led enterprises.
- → Address bottlenecks faced by women entrepreneurs by curating information and linking to existing schemes and institutional support.

• Key Features:

- → Financial Aid: Access to seed and growth capital.
- → Mentoring and Networking: Collaboration with industry leaders and peers.
- → Skill Development: Linking to training institutions and online programs.
- → Market Access: Marketing, branding, and export readiness support.
- → Compliance Services: Legal, accounting, and licensing guidance.
- → Incubation and Acceleration: For startups and scaling enterprises.





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→ **PPP Model:** WEP transitioned into a Public—Private Partnership (PPP) framework in 2022.

• Recent Initiatives:

- → Financing Women Collaborative (FWC): Improves women entrepreneurs' access to credit.
- → SEHER (2024): A financial literacy and credit education program in collaboration with TransUnion CIBIL.
- → Award to Reward (ATR) Initiative (2023): Encourages ecosystem collaboration while celebrating success stories.
- → We Rise Initiative (2025): Partnership with DP World to promote global trade opportunities for women entrepreneurs.

We Rise Initiative

• Key Objectives:

- → Export Readiness: Equip 100 high-potential women-led MSMEs to meet international trade standards.
- → Global Market Access: Connect Indian women entrepreneurs to global buyers through trade expos like *Bharat Mart* in Dubai's Jebel Ali Free Zone.
- → Mentorship and Capacity Building: Offer structured guidance on compliance, logistics, branding, and financing using DP World's global expertise.
- → Sustainable and Inclusive Growth: Promote women-led economic development aligned with India's Viksit Bharat @2047 vision.

• Features:

- → Implemented under WEP's ATR initiative- institutionalizes collaborations among ecosystem partners to create scalable and sustainable support for women entrepreneurs.
- → Encourages public—private partnerships to tackle common challenges faced by women entrepreneurs.
- → Identifies 100 high-potential women-led MSMEs across India- Provides tailored mentorship programs in trade facilitation, international compliance, logistics, and branding.





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→ Offers the selected entrepreneurs an opportunity to showcase products at Bharat Mart, Dubai, a B2B and B2C marketplace within the Jebel Ali Free Zone (Jafza).

• Significance:

- → Bridges the gender gap in export participation.
- → Strengthens India's women entrepreneurship ecosystem through mentorship and trade facilitation.
- → Serves as a model Public—Private Partnership (PPP) promoting women-led development.
- → Aligns with the "Women-led Development" goal and the Sustainable

 Development Goals (SDGs), especially SDG 5 (Gender Equality) and SDG 8

 (Decent Work and Economic Growth).

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6. Lead Pollution

- Prelims Lead Pollution
- Mains GS 3 Environment

Why in the news?

 A new study found that lead exposure continues to pose a serious public health and economic challenge in the 21st century, despite the global phase-out of leaded petrol.

Lead Pollution

• What is lead?

- → Lead (Pb) is a toxic heavy metal that accumulates in the environment and living organisms.
- → It is non-biodegradable and persists in soil, water, and air, causing long-term contamination.

• Sources of Lead Pollution

→ Industrial Sources:

- ★ Battery manufacturing and recycling (especially lead-acid batteries).
- ★ Smelting and mining of lead ores.
- ★ Paint and pigment industries.
- ★ Ceramics, glass, and plastic manufacturing.

→ Vehicular Emissions (historical):

★ Use of leaded petrol was a major source before it was phased out globally (India banned leaded petrol in 2000).

→ Domestic and Urban Sources:

- ★ Lead-based paints, plumbing pipes, contaminated dust, and old household products.
- ★ E-waste and informal recycling sectors.

→ Agricultural and Water Sources:

- ★ Contaminated soil and irrigation water near industrial areas.
- ★ Leaching from lead pipes into drinking water.

• Impacts

→ Health Impacts

- ★ Damage to brain and nervous system → reduced IQ, learning disabilities.
- ★ Anemia due to interference with hemoglobin synthesis.









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- ★ Kidney and liver damage.
- ★ Reproductive problems and developmental delays.
- ★ In adults: hypertension, cardiovascular issues, and neurological disorders.

→ Environment Pacts

- ★ Contaminates soil, water, and crops, entering the food chain.
- ★ Affects microbial activity in soil, reducing fertility.
- ★ Aquatic life suffers from bioaccumulation and toxicity.

• Government Measures in India

- → Ban on leaded petrol (2000).
- → Regulation of Lead in Paint Rules (2016): Limits lead content in paints to 90 ppm.
- → E-Waste Management Rules (2016): Regulates recycling of batteries and electronics.
- → National Programme for Elimination of Lead Poisoning (proposed): To monitor blood lead levels and raise public awareness.
- → Central Pollution Control Board (CPCB) monitors industrial lead emissions and water quality.

• Preventive and Mitigation Measures

- → Promote lead-free paints, batteries, and plumbing materials.
- → Enforce safe recycling and waste disposal practices.
- → Strengthen public health surveillance for lead exposure.
- → Raise awareness on occupational safety and hygiene in informal sectors.
- → Encourage green and circular economy practices in metal recycling