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FERTILISER CRISIS IN INDIA AMID GLOBAL SUPPLY DISRUPTIONS

Context

- India is facing a significant fertilizer challenge due to rising global prices and supply disruptions triggered by geopolitical tensions, particularly around the Strait of Hormuz amid the US–Israel vs Iran conflict.

Nature of the Crisis

- Sharp Increase in Prices:** Urea prices have nearly doubled within a short period, increasing from around \$508 per tonne in February to about \$935 per tonne in April.
 - Input materials such as sulphur and ammonia have also witnessed steep price increases, significantly raising fertiliser production costs.
- High Import Dependence:** India annually consumes 39-40 million tonnes (mt) of urea, of which 25% is imported.
 - Gulf countries account for nearly 40% of India's urea imports, making supply chains vulnerable to regional instability.
 - India also relies on West Asia for more than 60% of its liquefied natural gas (LNG), which is a key input for domestic urea production.
- Structural Imbalance in Fertiliser Use:** Urea accounts for nearly 55% of India's total fertiliser consumption, reflecting a heavy imbalance in nutrient usage.
 - Subsidy policies and price controls have encouraged excessive use of urea over other nutrients.

What are Fertilizers?

- Fertilizers are **concentrated plant nutrients** made from **inorganic chemicals**.
- Unlike organic manure, fertilizers contain nutrients in higher amounts and are **applied in smaller quantities**.



Subsidy Framework & Pricing Dynamics of fertilizers

- Urea Subsidy Scheme:** Under the scheme, urea is provided to farmers at a statutorily notified **maximum retail price (MRP)**.
 - The MRP of 45 kg bag of urea is 242 per bag (exclusive of charges towards neem coating and taxes as applicable) while the actual cost is around 3,000 for 45 kg bag.
- Nutrient-based subsidy policy:** It aims to promote the balanced use of fertilizers by linking subsidies to the nutrient content (nitrogen, phosphorus, potash, and sulfur) rather than the final product.
 - Under this scheme, the government sets a fixed subsidy amount per kilogram for each nutrient in P&K fertilizers.

Government's Initiatives in the Fertilizer Sector

- The Government introduced the **Nutrient Based Subsidy (NBS)** scheme in **2010** for phosphatic and potassic fertilizers.
 - Under this scheme, a fixed subsidy is provided for subsidised P and K Fertilizers, including di-ammonium phosphate, based on their nutrient content.
- The One Nation One Fertilizer scheme** was introduced to bring uniformity in branding and ensure transparency in the Fertilizer sector.
- PM PRANAM scheme:** PM Programme for Restoration, Awareness Generation, Nourishment and Amelioration of Mother – Earth (PMPRANAM) was launched to incentivize States/ Union Territories to promote alternate fertilizers and balanced use of chemical fertilizers.

Way Ahead

- Capacity Expansion:** Speeding up commissioning of domestic urea plants under "Atmanirbhar Bharat" will reduce import reliance.
- Sustainable Practices:** Wider adoption of nano-urea, bio-fertilisers, and soil health cards can reduce chemical fertiliser intensity over time.
- Improving Supply Chain Resilience:** India should diversify its import sources to reduce dependence on specific regions. Strategic reserves of fertilisers should be developed to manage future disruptions.
- Encouraging Biostimulants:** Biostimulants should be promoted as they enhance nutrient uptake and improve plant metabolism.
 - These products can reduce the effective requirement of chemical fertilisers by improving their efficiency.

Source: IE

INDIA-SOUTH KOREA SPECIAL STRATEGIC PARTNERSHIP

Context

- Recently, **India and South Korea** have taken a significant step in strengthening bilateral relations by deciding to resume negotiations for upgrading the **Comprehensive Economic Partnership Agreement (CEPA)**.

Key Outcomes of the Bilateral Meeting

- Strategic Vision:** Adoption of a **Joint Strategic Vision** for deepening the *Special Strategic Partnership*. Focus areas include:
 - ♦ **Chips to Ships** (semiconductors to shipbuilding)
 - ♦ **Talent to Technology**
 - ♦ **Environment to Energy**
- Key Agreements Signed: Digital Cooperation (India-Korea Digital Bridge)** that include Artificial Intelligence (AI), Semiconductors, and Information Technology.
 - ♦ **MoUs in key sectors** like shipbuilding, sustainability, steel, ports. Cooperation in Small and Medium Enterprises (SMEs); Sports and Culture.
- Economic Relations and CEPA:** CEPA was signed in **2010**, which boosted bilateral trade.
 - ♦ **Current Trade Structure:** Imports from South Korea is about **\$21 billion**; and exports to South Korea is about **\$5.8 billion**. It indicates a **trade imbalance in Korea's favour**.
 - ♦ Trade growth from **\$14.2 billion (2010)** to **\$26.89 billion (2024–25)** (about 90% increase).
- CEPA Upgradation:** It aims to increase trade to **\$50 billion by 2030**; and improve market access and investment conditions.
 - ♦ New institutional mechanisms include **India-Korea Financial Forum, Industrial Cooperation Committee, and Economic Security Dialogue**.

Strategic and Geopolitical Dimensions

- Indo-Pacific Cooperation:** South Korea joins **International Solar Alliance (ISA)**; and **Indo-Pacific Oceans Initiative**.
 - ♦ It shared commitment to peaceful, inclusive Indo-Pacific, maritime security and cooperation.
- Global Governance:** Both countries emphasize **reform of global institutions**; and cooperation on global crises (Middle East, Europe).
- Energy and Supply Chains:** Focus on stability of energy supplies, resilient supply chains for critical commodities.

Maritime and Industrial Cooperation

- Shipbuilding and Logistics:** Strategic sector collaboration in Korean technological expertise and Indian policy support.
 - ♦ Objectives include to establish shipbuilding facilities in India, increase ship production incentives, and expand maritime logistics cooperation.
- Industrial Ecosystem:** Proposal for **Korean Industrial Township in India**, and encouragement for Korean SMEs to invest in India

Cultural and People-to-People Ties

- Cultural Exchange:** Establishment of **Mumbai Korea Centre** for K-pop performance hub, and cultural collaboration platform.
- Soft Power Diplomacy:** Rising popularity of K-pop and K-dramas in India, and Indian cinema in Korea.

Conclusion

- India–South Korea relations are entering a **new phase of strategic depth**, combining economic, technological, and geopolitical cooperation.
- The proposed CEPA upgrade, digital partnerships, and maritime collaboration indicate a shift toward a **comprehensive, future-oriented partnership**, aligned with evolving global and regional dynamics.

Note: For more about India-South Korea relations, please refer to <https://www.nextias.com/ca/editorial-analysis/18-04-2026/india-south-korea-ties>

Source: IE

SCIENCE BEHIND SMART WASHBASINS

In Context

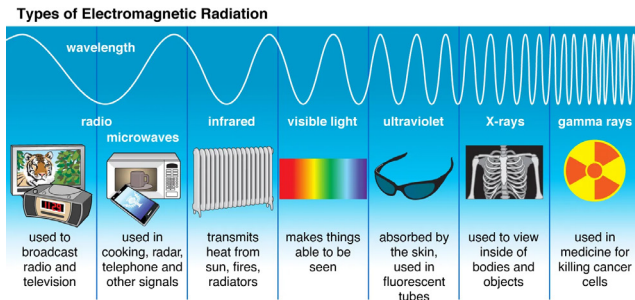
- Smart washbasins have gained widespread adoption across high-traffic public spaces like multiplexes, airports, metro stations, and malls.

What Is a Smart Washbasin?

- A smart washbasin is an automated plumbing fixture that uses **electronic sensors to control water flow without any physical contact**.
- It belongs to the broader family of **phygital devices (physical + digital integration)** that combine mechanical infrastructure with digital sensing technology to enhance hygiene, water efficiency, and user experience in public and private spaces.

The Science Behind It

- **Electromagnetic (EM) Radiation:** It refers to waves generated by the oscillation of electric and magnetic fields simultaneously capable of travelling through vacuum without any medium.
 - ◆ Unlike sound waves (which need air) or water waves (which need water), EM waves are self-sustaining oscillations of electric and magnetic fields perpendicular to each other and to the direction of propagation.



- **Infrared (IR) Radiation:** It occupies the region of the EM spectrum just below the frequency of red visible light, the word “infra” meaning “below.” Its frequency range is approximately 300 GHz to 400 THz, with wavelengths between 700 nanometres and 1 millimetre.
 - ◆ IR radiation is emitted by all objects with a **temperature above absolute zero (0 Kelvin)** including the human body. It **cannot be seen by the human eye but can be detected by specialised sensors.**

How Smart Washbasins Work?

The system functions as an invisible optical loop built on two primary components working in tandem:

- **Component 1: IR-LED (Infrared Light Emitting Diode):** Acts as an invisible torch, continuously emitting infrared light into the space beneath the tap. This emission is constant, regardless of whether a hand is present or not.
- **Component 2: Photodiode (Sensor):** A semiconductor device that conducts electricity when infrared light of the correct frequency falls on it — functioning as an electronic switch calibrated to respond only to specific IR frequencies.

Key Features

- **Touchless Operation:** Eliminates physical contact entirely, the most significant hygiene benefit in high-traffic public spaces where cross-contamination risk is highest.
- **Frequency Specificity:** Photodiodes are calibrated to respond only to the specific IR frequency emitted by the paired LED.

- **Automatic Shut-off:** The circuit breaks instantly when the reflecting surface (hand) is removed, preventing water wastage from taps being left running, which is a persistent problem with traditional manual fixtures.

Significance

- **Public Health:** Touchless operation removes a critical contact point for pathogen transmission in restrooms like during COVID-19 pandemic.
- **Water Conservation:** India loses significant volumes of potable water annually to running taps in public facilities. The instant-off mechanism helps directly contribute to India’s water security goals under Jal Shakti Abhiyan and Atal Mission for Rejuvenation and Urban Transformation (AMRUT).
- **Smart Cities Mission:** Sensor-driven public infrastructure is a tangible deliverable of India’s Smart Cities Mission, which targets technology-integrated urban living across 100 selected cities.
- **Accessibility:** Touchless fixtures significantly improve accessibility for elderly individuals, persons with disabilities.

Source: TH

INDIA’S FOREST CARBON STORAGE MAY NEARLY DOUBLE BY 2100

Context

- A recent study published in Environmental Research: Climate highlights that India’s forests could store nearly twice as much carbon by 2100 under different climate change scenarios.

Carbon storage by India’s forests

- India’s forests act as a significant carbon sink by **absorbing carbon dioxide** from the atmosphere and **storing it in biomass and soil.**
- According to the Forest Survey of India, the total forest carbon stock increased from 6.94 billion tonnes in 2013 to **7.29 billion tonnes in 2023.**
- The carbon stock includes carbon stored in **above-ground biomass, below-ground biomass, dead wood, litter, and soil organic carbon.**

Key Findings of the Study

- The study projects that **vegetation carbon biomass in India may increase significantly** by the end of the century under all emission pathways.
- The increase in forest carbon is primarily driven by **higher precipitation and elevated atmospheric carbon dioxide** levels.

- **Spatial Patterns of Change:**

- ♦ The highest relative increase in vegetation carbon is expected in arid and semi-arid regions such as **Rajasthan, Gujarat, and western Madhya Pradesh.**
- ♦ These regions may witness **more than 60%** increase in vegetation carbon under high-emission scenarios due to improved moisture conditions.
- ♦ Regions such as the **Trans-Himalayas, the Gangetic plains, and the Deccan Plateau** are also projected to experience moderate increases.
- ♦ Biodiversity-rich regions such as the **Western Ghats and the Himalayas** are expected to show relatively smaller increases due to **ecological saturation and climatic constraints.**

Significance of increased Carbon storage

- Forest carbon storage plays a **crucial role in climate change mitigation** by reducing atmospheric greenhouse gases.
- **Creation of Carbon Sink:** India has committed to creating a carbon sink of **3.5 to 4 billion tonnes** of CO₂ equivalent through forest and tree cover by 2035 under Nationally Determined Contributions (NDCs).

What are the Concerns?

- The projected increase in carbon storage does not imply that climate change is beneficial for forests.
- Risks such as **deforestation, land-use change, forest fires, pests, and extreme weather events** can reverse gains.
- Climate change may lead to **ecosystem instability and sudden carbon release.**

Steps Taken by India to Enhance Forest Carbon Storage

- The **Green India Mission** focuses on afforestation, reforestation, and restoration of degraded forest landscapes.
- The **Compensatory Afforestation Fund Act (CAMPA)** ensures that forest land diverted for non-forest use is compensated by afforestation activities elsewhere.
- India promotes agroforestry through the **National Agroforestry Policy**, encouraging farmers to integrate trees with crops and livestock systems.
- India is a signatory to the **Bonn Challenge**, committing to restore **26 million hectares** of degraded land by **2030.**
- Urban forestry initiatives, including the **Nagar Van Yojana**, aim to create green spaces in

cities, contributing to carbon sequestration and improved air quality.

- India participates in global initiatives such as **REDD+ (Reducing Emissions from Deforestation and Forest Degradation)** to enhance carbon sequestration and access climate finance.

Way Ahead

- There is a need to strengthen **protection of existing dense forests**, as mature forests store significantly more carbon and are more resilient than newly planted forests.
- Afforestation programmes must **prioritise native and diverse species**, avoiding monoculture plantations that provide limited ecological and carbon benefits.
- Forest management strategies must be **region-specific and climate-informed**, especially for vulnerable zones such as semi-arid regions, Himalayan ecosystems, and coastal forests.

Source: TH

NEWS IN SHORT

INDO-LANKA ACCORD (1987)

Context

- Tamil political parties in Sri Lanka have urged India to sustain pressure for full implementation of the Indo-Lanka Accord.

Indo-Lanka Accord (1987)

- The Indo-Lanka Accord was a **bilateral agreement signed in July 1987** between **Rajiv Gandhi and J. R. Jayewardene** to address the ethnic conflict in Sri Lanka.
- **Objectives:** The Accord aimed to resolve the long-standing conflict between the Sinhalese-majority government and Tamil minorities.
- **Key Provisions:** It sought to **ensure the devolution of political powers** to provinces in order to provide greater regional autonomy.
 - ♦ It granted **official status to the Tamil language** alongside Sinhala.

13th Amendment to the Sri Lankan Constitution (1987)

- The 13th Amendment was **enacted in 1987** to **operationalise the provisions of the Indo-Lanka Accord** and provide a constitutional framework for devolution.

- **Key Features:**

- ♦ The Amendment **established Provincial Councils** in all nine provinces to facilitate decentralised administration.
- ♦ It **introduced a three-fold distribution of powers** through the **Provincial List, Reserved List, and Concurrent List**, broadly resembling the Indian federal structure.
- ♦ It enabled the **transfer of several functional subjects** such as education, agriculture, health, and local governance to the provincial level.

Source: TH

NATIONAL MEDICAL COMMISSION (NMC)

Context

- The **National Medical Commission (NMC)** has proposed amendments to the **Registration of Medical Practitioners and Licence to Practice Medicine (Amendment), Regulations, 2026**, aiming to expand medical education capacity while strengthening quality standards.

About National Medical Commission (NMC)

- NMC is **India's apex statutory body** responsible for regulating medical education, professionals, and institutions.
- **It was established in 2020**, under the **National Medical Commission Act, 2019**, replacing the **Medical Council of India (MCI)** to streamline governance and improve the quality of healthcare nationwide.
- It operates through **four autonomous boards**;
 - ♦ Under-Graduate Medical Education Board (UGMEB)
 - ♦ Post-Graduate Medical Education Board (PGMEB)
 - ♦ Medical Assessment and Rating Board (MARB)
 - ♦ Ethics and Medical Registration Board (EMRB)
- **Structure of NMC:** The NMC consists of;
 - ♦ A Chairperson.
 - ♦ 10 ex-officio members (including representatives from ministries and institutions).
 - ♦ 22 part-time members (including State representatives and experts).

Source: TH

INDIA AS A CENTRE OF JAMUN EVOLUTION

Context

- A recent study has revealed that **Syzygium (Jamun)** originated much earlier than previously believed, with India playing a central role in its evolution.

Origin and Evolution

- The origin of Syzygium was **earlier believed to be limited to Australia or Southeast Asia**.
 - ♦ Recent fossil evidence from India has challenged this view and established a much older origin.
- Newly discovered **Early Miocene fossils (~20 million years ago)** from the **Kasauli Formation in Himachal Pradesh**, including 11 well-preserved leaves identified as **Syzygium paleosalicifolium**, confirm its continuous presence in India.
- The genus is now traced back to an **East Gondwanan origin (~80 million years ago)**.
- India acted as a major centre of early diversification, from where the genus later dispersed to Southeast Asia and Australia.

About Jamun

- Jamun is a genus of flowering plants that belongs to the **family Myrtaceae**.
- The genus is widely distributed across **tropical and subtropical regions** and includes species of ecological and economic importance.
- **Medicinal Properties:** Jamun holds an important place in traditional systems of medicine such as **Ayurveda and Unani**.
 - ♦ It is particularly known for its **anti-diabetic properties** due to compounds like **jamboline**.
- **Distribution:** Jamun is widely distributed across India, Bangladesh, Pakistan, Sri Lanka, Malaysia, and Philippines.
- **Ecological significance:** The species is often used in **social forestry programmes** as it plays a role in afforestation and reclamation of degraded lands.

Source: PIB

FATA MORGANA

In News

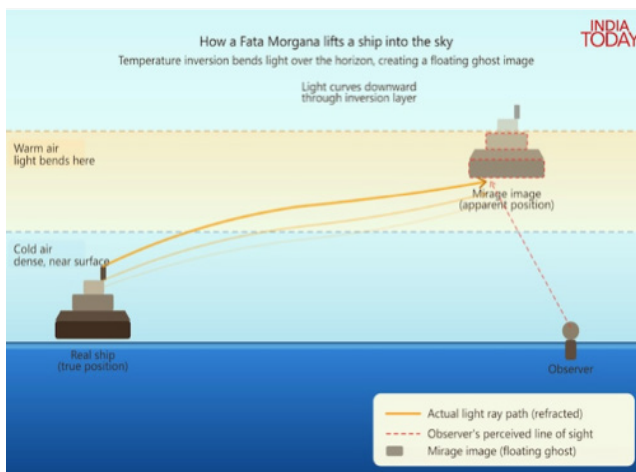
- Videos of ships appearing to float several metres above the ocean surface have gone viral on social media, reigniting scientific interest in the **Fata Morgana**.

About Fata Morgana

- Fata Morgana is a **type of superior mirage, an optical phenomenon** in which light from a distant object, such as a ship, coastline, or iceberg, is bent through layers of air with sharply different temperatures, causing the object's image to appear displaced typically elevated high above its actual position.
- The name derives from the **Arthurian sorceress Morgan le Fay**, whose legends in Italian folklore described castles and cities rising from the sea.

The Physics Behind It

- **Refraction of Light:** Means the bending of light when it passes from one medium into another of different optical density.
 - ♦ When light passes from a less dense medium (warm, thin air — where it travels faster) into a more dense medium (cold, dense air — where it travels slower), it bends toward the denser medium.
- **Temperature Inversion:** Under normal atmospheric conditions, air temperature decreases with altitude, the ground absorbs solar radiation, heats the air directly above it, and warmth diminishes as height increases. This is the standard atmospheric lapse rate.
 - ♦ A **temperature inversion is a reversal of this normal order** where a layer of cold, dense air sits directly below a layer of warmer, lighter air. This inverted arrangement is the essential atmospheric precondition for Fata Morgana formation.
- **Atmospheric Ducting and Beyond-Horizon Propagation:** In a temperature inversion, as light from a distant ship travels toward an observer, it enters the inversion layer — the sharp thermal boundary between cold air below and warm air above. At this boundary, light continuously refracts downward — curving along the temperature gradient rather than escaping upward into the sky.



- ♦ If the temperature difference between the two layers is steep enough, light curves so dramatically that it bends around the curvature of the Earth — reaching an observer who is technically beyond the ship's geometric horizon. Under normal conditions, an object 40 kilometres away would be completely hidden below the horizon.

Source: IT

ODISHA: 1ST STATE TO LAUNCH MARINE SPATIAL PLAN

Context

- The Odisha government recently signed a memorandum of understanding with the National Centre for Coastal Research under the Union Ministry of Earth Sciences to launch a **Marine Spatial Plan (MSP)** in the state for integrated coastal and marine planning.

About

- Sustainable ocean planning has been underway in India since **2019**, with collaboration between **India and Norway**.
- In the first phase, it was taken up in two Union Territories, **Puducherry and Lakshadweep**.
- Odisha, with a coastline of over **550 km**, has become the **first state** in the country to implement MSP in the second phase.

What is the Marine Spatial Plan (MSP)?

- Marine Spatial Planning is a **tool for sustainable and integrated ocean management** aimed at boosting the Blue Economy and strengthening climate resilience.
- It enables the sustainable utilisation of marine resources across sectors such as ports, fisheries, aquaculture, tourism, and industry.
- Under the plan, **benthic mapping** is carried out to study underwater ecosystems. Parameters such as salinity and temperature are also analysed to identify suitable zones for tourism, fisheries, seagrass, seaweed cultivation, and other economic activities.

Source: IE

LUMPONGDENG ISLAND

Context

- After protests by conservation groups, the Meghalaya government dropped the proposed luxury resort project on Lumphongdeng Island.

About

- Lumpondeng Island is located in **Umiam Lake**, a manmade reservoir formed in the early 1960s by damming the Umiam River for a hydroelectric project, about 20 km from Shillong.
- The island is characterised by coniferous vegetation and lies near the centre of the lake.

Source: TH

