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A Day to Pause and Come Down to Earth

Context

- Every year on **December 5, World Soil Day** invites the global community to pause and reflect on one of the most fundamental yet overlooked elements of human existence: soil.
- Far from being inert dirt, soil is a living resource that sustains ecosystems, food systems, and ultimately civilisation itself.
- The 2025 theme, **Healthy Soils for Healthy Cities**, marks a deliberate shift in focus from rural landscapes to the urban world.
- In doing so, it underscores a powerful but often neglected reality: even in the heart of the world's busiest cities, soil remains a dynamic ally in shaping a resilient and sustainable future.

Urban Soil: The Hidden Engine of City Resilience

- As the global population becomes increasingly urban, now exceeding 56%, cities face **mounting challenges**.
- Food insecurity, climate-induced heat, pollution, and flooding threaten the health and safety of millions.
- Beneath these problems, however, lies a crucial yet frequently **invisible solution: urban soil**.
- Urban soil rarely commands attention, as it is overshadowed by concrete skylines and technological innovation. Yet it performs vital **ecosystem functions**.
- Healthy soil acts simultaneously as a living filter, a natural sponge, and a powerful carbon sink.
- Its **biological richness**, a teaspoon of soil holds more organisms than the Earth has people, enables it to perform roles that are indispensable to urban well-being.

Significant Roles of Healthy Urban Soil

- **Mitigating Climate Change**
 - One of the roles is **mitigating climate change and extreme heat**, especially in urban heat islands, where temperatures soar several degrees above surrounding rural areas.
 - Soils covered with vegetation absorb heat, store carbon, and moderate microclimates, functioning like natural air conditioners.
 - **Water Management**

- Urban soil also plays a central role in **water management**. As cities expand, impermeable concrete surfaces worsen flood risk, preventing water from infiltrating the ground.
- Healthy soil behaves differently: it absorbs rainfall, filters runoff, and replenishes groundwater, forming the front line of defence against climate-intensified storms.

- **Local Food Production and Human Well-Being**

- Furthermore, as urban agriculture grows, whether on rooftops, in community gardens, or through backyard plots, **fertile soil becomes a cornerstone of local food production**, reducing supply chain vulnerabilities.
- These soil-based habitats also support biodiversity, from microbes and earthworms to essential pollinators.
- Finally, soil-dependent green spaces nourish not only ecosystems but also human well-being.
- Access to nature, often called **Vitamin N**, reduces stress, enhances mental health, and encourages physical activity, linking soil health directly with the quality of urban life.

The Threat to Urban Soil

- Despite its value, urban soil is among the **most degraded natural resources**.
- The FAO reports that nearly one-third of global soils are already compromised, a condition amplified in urban environments.
- **Industrial contamination**, compaction from construction, loss of organic matter, and extensive soil sealing by asphalt and concrete **suffocate soil ecosystems**.
- These pressures undermine plant growth, weaken urban food systems, and diminish the natural services cities depend upon.
- Thus, the 2025 World Soil Day theme represents not only a celebration but also an **urgent call to action**.

Towards Healthier Cities: A Blueprint for Urban Soil Stewardship

- The Healthy Soils for Healthy Cities campaign offers a roadmap for transforming urban landscapes and empowering communities to value and protect the soil beneath their feet.
- First, **urban soil restoration and protection** are essential. This includes rehabilitating degraded areas through compost, organic amendments, and regular soil testing.
- Equally important is limiting further soil sealing during construction, preserving soil's capacity to breathe and function.
- Second, cities must **promote green infrastructure** that integrates soil as a core element.
- Replacing unnecessary concrete with rain gardens, parks, tree belts, and other soil-based systems cools cities, enriches biodiversity, and strengthens climate resilience.
- Third, **urban agriculture** should be championed for its environmental, social, and nutritional benefits.
- From balcony containers to community allotments, growing food reconnects residents with the natural world and enhances soil health.
- Fourth, residents and planners alike must adopt **responsible soil management** practices, including reducing chemical inputs, planting native species, and protecting topsoil through mulching.

- Finally, strengthening **soil literacy** is vital.
- Schools, community groups, and households can all contribute by learning about soil ecosystems, conducting soil tests, and practicing composting, turning organic waste into nourishment for urban soil.

Conclusion

- On this World Soil Day, the message is unmistakable: **the strength of a city** rests not only in its architecture but **also in the living soil** that lies beneath it.
- Healthy soils form the foundation of healthy cities, shaping climate resilience, food security, biodiversity, and public well-being.
- As urban populations continue to rise, caring for soil becomes not just an **environmental responsibility** but a social imperative.
- By nurturing the ground beneath our feet, we safeguard our health, our cities, and our **shared future**.

A Day to Pause and Come Down to Earth FAQs

Q1. What is the main theme of World Soil Day 2025?

Ans. The main theme of World Soil Day 2025 is “Healthy Soils for Healthy Cities.”

Q2. Why are urban soils important for climate resilience?

Ans. Urban soils help absorb heat, store carbon, and moderate temperatures, making cities more resilient to climate change.

Q3. How do healthy soils help prevent flooding in cities?

Ans. Healthy soils act like sponges that absorb rainfall, filter runoff, and reduce the risk of urban flooding.

Q4. What role does urban agriculture play in cities?

Ans. Urban agriculture provides fresh food, strengthens local food systems, and depends on fertile, healthy soil.

Q5. What is one key action citizens can take to improve urban soil health?

Ans. Citizens can improve urban soil health by composting kitchen waste to create nutrient-rich organic matter.

Source: **The Hindu**

A Missing Link in India’s Mineral Mission

Context

- India’s evolving strategy for critical minerals reflects a recognition that value lies not in extraction but in transforming ores into **high-purity materials** essential for clean energy and advanced manufacturing.
- The Union Cabinet’s new **₹7,280-crore rare-earth magnet scheme** and the G-20 framework on critical minerals indicate a strategic shift toward midstream value creation.
- This shift is urgent, as the resilience of future industries depends on **control over refining capacity** rather than simply on mineral reserves.

The Global Context: A Chokepoint in the Midstream

- Critical mineral supply chains have become instruments of geopolitical influence.
- **China dominates over 90% of rare-earth** and graphite refining and most lithium and cobalt processing, creating a global bottleneck.
- Temporary export controls in 2025 showed how easily these supply chains can be disrupted. India's dependence on imported refined materials, despite domestic mining reforms, therefore represents a significant vulnerability.
- **India imports nearly all its lithium**, nickel, and cobalt, even though these materials underpin renewable energy systems, semiconductors, telecommunications, pharmaceuticals, and defence manufacturing.
- Without domestic refining capacity, India remains exposed to geopolitical shocks and global price distortions.

India's Processing Gap: A Structural Weakness

- India already mines and processes several critical minerals, copper, graphite, silicon, tin, titanium, rare earths, and zirconium, but **refining capacity lags** in both quality and scale.
- Battery-grade graphite requires 99.95% purity, far above current domestic levels.
- Rare earths are processed into oxides but not separated into the metals needed for magnets, and tin production meets only a fraction of domestic demand.
- This gap traps India in low-value roles: **exporting raw materials while importing high-value components**.
- Such dependence threatens the broader economy and undermines aspirations for technological self-reliance.

Five Strategic Interventions for Building Refining Capacity

- **Transform Centres of Excellence into Engines of Applied Innovation**
 - The nine Centres of Excellence under the National Critical Mineral Mission must prioritise commercially deployable processing technologies with clear metrics for purity, recovery, cost, and waste.
 - Collaboration among IITs, NITs, industry, and research institutions is essential to accelerate the transition from laboratory innovation to industrial deployment.
- **Mobilise Secondary Resources as Domestic Mineral Sources**
 - India generates massive quantities of industrial waste, coal fly ash, red mud, zinc residues, and steel slag, that contain recoverable critical minerals.
 - **Pilot studies show recovery is viable**, but scaling requires incentives, streamlined environmental clearances, and integration with proposed **Critical Minerals Processing Parks**.
 - Leveraging secondary resources can significantly reduce import dependence while lowering environmental impact.
- **Build a Skilled Workforce in Advanced Refining Technologies**

- Most of India's metallurgical workforce is trained for bulk metals, not for **hydrometallurgy and advanced chemical refining**, which critical minerals require.
- A dedicated skilling programme must introduce new curricula, fund train-the-trainer modules, and expand apprenticeships with established refiners.
- This can create **thousands of specialised jobs** in mineral-rich states such as Odisha, Gujarat, and Jharkhand.

• De-risk Investments Through Market-Shaping Tools

- Global critical mineral prices are often kept artificially low, discouraging new entrants.
- India's planned mineral stockpile could become an **active market stabiliser**, offering offtake guarantees and price assurance during downturns.
- Key sectors, defence, pharmaceuticals, electronics, should commit to partial domestic sourcing, ensuring **steady demand and investor confidence**.
- Refiners must meet strict quality and reliability standards to build trust across supply chains.

• Leverage Mineral Diplomacy to Build Processing Partnerships

- India's overseas acquisitions in Argentina and Zambia must be complemented by strong domestic refining.
- Processing strength converts **resource access into strategic leverage**, enabling co-investment agreements rather than raw-ore transactions.
- Partnerships such as the Australia-Canada-India Technology and Innovation framework demonstrate how trilateral cooperation can advance processing technologies.
- Multilateral forums, from BRICS to the G-20, should **integrate critical mineral processing** into trade and investment dialogues.

Strategic Implications: Refining as the Foundation of Autonomy

- In critical mineral supply chains, **processing determines power**. Mines represent potential, but refineries create strategic capability.
- Investing in **midstream capacity reduces import dependence**, anchors high-value industries, generates skilled employment, and enhances geopolitical resilience.
- The key question is no longer whether India has sufficient mineral reserves but whether it can refine those minerals into **high-purity materials** that feed the industries of the future.

Conclusion

- India's most pressing mineral challenge lies not in extraction but in **developing the refining infrastructure** essential for technological and strategic autonomy.
- By combining innovation, recycling, workforce development, investment support, and international collaboration, India can transition from a supplier of raw materials to a producer of high-value, **strategically indispensable materials**.

- **True autonomy** in the clean-energy era will be defined not by **what nations mine but by what they can refine.**

A Missing Link in India's Mineral Mission FAQs

Q1. Why is processing more important than mining in critical mineral supply chains?

Ans. Processing is more important because it transforms raw ores into high-purity materials that power modern industries and create strategic leverage.

Q2. What makes India vulnerable in the global critical minerals landscape?

Ans. India is vulnerable because it depends heavily on imported refined materials despite possessing mineral reserves.

Q3. How can secondary resources help India reduce import dependence?

Ans. Secondary resources can help by allowing critical minerals to be recovered from industrial waste such as fly ash and red mud.

Q4. Why does India need specialised metallurgical training for critical minerals?

Ans. India needs specialised training because critical minerals require advanced hydrometallurgical and chemical refining skills not covered by traditional metallurgy.

Q5. How can mineral diplomacy strengthen India's position in global supply chains?

Ans. Mineral diplomacy can strengthen India's position by enabling co-investment partnerships that convert overseas mineral access into processing and technological advantage.

Source: **The Hindu**

Census 2027 - Counting India, Renewing the Republic

Context

- India has **missed the decennial Census** for the first time in 143 years.
- With the last Census conducted in 2011, the next round — now termed Census 2027 — marks a 16-17-year gap.
- This has raised pressing concerns for governance, welfare delivery, federalism, representation, and democratic accountability.

The Constitutional Significance of Census 2027

- **Why the delay matters**
 - The 2021 Census was cancelled despite elections being held during the pandemic.
 - India has been functioning using outdated 2011 population data, affecting welfare schemes, urban planning, fiscal federalism (Finance Commission transfers), and budgeting and policy design.

- **Renaming to “Census 2027” (rather a delayed Census 2021)**

- It enables the first Lok Sabha delimitation since 1976, frozen by the **84th Constitutional Amendment** until “the first Census after 2026”.
- It will also trigger **women’s reservation** (dependent on delimitation) — though the government’s 2029 promise is mathematically impossible given delimitation’s four-to-six-year track record.

Census 2027 – India’s First Digital Census

- **Advantages:** Tablet-based enumeration will result in faster enumeration and fewer errors. It enables real-time monitoring and quicker publication.
- **Concerns:**
 - Potential linkage with Aadhaar, national population register (NPR), and voter rolls risks of **surveillance**, privacy violations, and citizen profiling.
 - Need for strict **legal safeguards** ensuring data use only for statistical purposes, no law-enforcement or citizenship verification usage, independent data-protection audits.

The Debate on Caste Enumeration

- **Historical background**

- **1931:** Caste was last comprehensively counted under the colonial administration. **Independent India** : Counting of Scheduled Castes and Scheduled Tribes for reservation – rationale was nation-building.
- **2011 Socio-Economic and Caste Census (SECC):** It attempted to count all castes, but its findings remain unreleased — officially due to data quality concerns, unofficially due to political sensitivities.

- **Why caste data matters**

- Informs debates on OBC reservations, **social justice policies**, and resource allocation.
- Provides evidence for marginalised groups.
- Not collecting caste data leads to policy dependent on political assertions, not demographic facts.

- **Government ambiguity**

- No clarity on whether Census 2027 will enumerate caste. **Indecision** threatens accuracy, legitimacy, and transparency.

Migration – India’s Biggest Statistical Blind Spot

- **Current distortion**

- Migrant workers counted in home states, not where they work.
- They remain registered as voters in ancestral villages, not cities where they live.

- **Consequences**

- **Urban governance** becomes unaccountable to migrant populations.
- Rural areas receive allocations for people who no longer reside there.
- Millions become non-participatory economic contributors.

- **Legal provisions**

- Electoral law requires registration where a person is “normally resident” for more than six months.
- Requires **inter-state coordination** and updated electoral rolls.

Ensuring Transparency and Federal Trust

- **Key requirements**

- Real-time access to enumeration data for states.
- Public dashboards tracking district-level progress.
- **Independent audits** before publication.
- The 2011 SECC experience — caste data unreleased for over a decade — must not be repeated.

- **Purpose**

- Census must be seen as an instrument of **fairness**, not control. Federal trust depends on transparency and **procedural integrity**.

Challenges and Way Forward

- **Over 16 year data vacuum:** Affect welfare, planning, and fiscal transfers. Comprehensive enumeration including caste with scientific methodology.
- **Migration miscount:** This will distort electoral representation and urban governance. Therefore, accurate counting of migrants based on actual residency is needed.
- **Privacy and surveillance risks from digital data:** Robust data-protection framework—legal firewalls preventing linkage with Aadhaar/NPR.
- **Potential politicisation of enumeration and data release:** Federal transparency through real-time data access and independent audits. Timely publication of all data collected to avoid SECC-like opacity.
- **Ambiguity on caste enumeration and risk of delimitation delays:** Affecting welfare policies, women’s reservation and federal representation. Clear communication on delimitation timelines, women’s reservation, and scope of the digital Census.

Conclusion

- Census 2027 is more than a demographic exercise — it is a constitutional, political, and **moral moment** for the Republic.

- After a 17-year gap, India must ensure a comprehensive, transparent, accurate, and protected census.
- A democracy that stops counting its people risks ignoring them; a democracy that counts with fairness and foresight **governs with justice**.

Census 2027 FAQs

Q1. Why is the delay in conducting the Census a challenge for governance in India?

Ans. Because policies, welfare schemes, and fiscal transfers are still based on outdated 2011 data, creating severe planning distortions.

Q2. How does the 84th Constitutional Amendment relate to Census 2027?

Ans. It mandates delimitation only after “the first Census after 2026,” making Census 2027 the trigger for future delimitation and women’s reservation.

Q3. What are the implications of not collecting caste data in Census 2027?

Ans. Policy-making on OBC reservations and social justice will continue relying on political claims instead of demographic evidence.

Q4. Why is migration a critical blind spot in population enumeration?

Ans. Because migrants are counted in home states but live in cities where they are unrepresented, distorting both governance and electoral rolls.

Q5. What are the key privacy concerns associated with a digital-first Census?

Ans. Risks of linking Census data with Aadhaar/NPR, enabling surveillance or citizen profiling without stringent legal safeguards.

Source: **IE**

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