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EDITORIAL ANALYSIS

AI's Hidden Footprint: Planning Power and Water for the Data-Centre Age

BUSINESS STANDARD

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CURATED & WRITTEN BY

Bharat Choudhary

UPSC Educator & Content Creator

linkedin.com/in/epicbharat

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Business Standard 5 July 2026 GS3

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THE LIFT LINE

Every ChatGPT query and AI image hides a physical cost in megawatt-hours and litres of water; the cloud is not weightless, and India cannot chase an AI future without a matching plan for the power and water it drinks.

WHY THIS EDITORIAL MATTERS FOR YOUR EXAM

This is a live GS3 case that fuses three high-frequency themes: infrastructure, energy security (https://ujiyari.com/terms/energy-security/) and environmental sustainability. The examiner increasingly frames technology not as a standalone marvel but as a claim on scarce natural resources, exactly the analytical move UPSC rewards.

GS Paper 3: Infrastructure (energy, ports, roads); conservation and environmental pollution; science and technology developments and their applications; indigenisation (https://ujiyari.com/vocab/indigenisation/) of technology; the digital economy and its resource footprint.

The editorial also connects to GS1 (resource distribution, water stress) and GS2 (governance of a rapidly digitising state), letting you carry one fact set across multiple answers.

BACKGROUND AND CONTEXT

A data centre is a warehouse of servers that stores, processes and transmits the world's digital traffic. As artificial intelligence workloads exploded, so did the electricity these buildings draw and the water they use to stay cool.

The International Energy Agency's *Energy and AI* analysis found global data-centre electricity consumption reached roughly **448 TWh in 2025**, already larger than the total annual power consumption of a mid-sized industrial economy such as Saudi Arabia, and about 1.5 per cent of world electricity. In its base case the IEA projects this will roughly **double to around 945 TWh by 2030**, just under 3 per cent of global electricity, comparable to Japan's entire consumption today. AI is the single largest driver: power use by accelerated (AI) servers is set to grow around 30 per cent a year.

India is no bystander. Its data-centre IT capacity quadrupled from about 0.4 GW in 2020 to roughly 1.5 GW by 2025, with consultancies projecting 8 to 10 GW more by 2030. The water side is equally stark: a Council on Energy, Environment and Water (CEEW) assessment notes a typical 100 MW hyperscale facility can consume around 20 lakh litres of water a day for cooling, and India's data centres are estimated to have drawn close to 150 billion litres in 2024-25.

THE CORE ARGUMENT / ISSUE

The central claim is simple: **digital infrastructure is physical infrastructure**, and India's AI ambition will collide with real limits on power and water unless it is planned as deliberately as a steel plant or a port.

The twin resource squeeze

Data centres impose two distinct stresses. The first is on the grid: they demand firm, round-the-clock power, precisely the kind that a variable renewable fleet struggles to supply alone. The second is on water: evaporative cooling towers, the cheapest option, consume the most freshwater, and India's clusters, Mumbai, Chennai, Hyderabad, Bengaluru, often sit in already water-stressed basins.

The siting mismatch

Capital chases connectivity and land, not water security. When a thirsty facility lands in a stressed basin, it competes directly with farms and households, turning a growth story into a distributional conflict.

METRIC	GLOBAL (IEA / IRENA)	INDIA (CEEW / MNRE)
Data-centre power, 2025	~448 TWh (> Saudi Arabia's total use)	~1.5 GW IT capacity
Projected power, 2030	~945 TWh (base case)	8 to 10 GW capacity added
Water per 100 MW facility	Hundreds of thousands of litres/day	~20 lakh litres/day (cooling)
Main driver	AI servers (~30% annual growth)	AI + cloud + digital public infrastructure
Key risk	Grid strain, emissions	Grid strain plus local water stress

The efficiency counter-argument

Optimists note that efficiency gains, better chips, liquid and immersion cooling, and higher server utilisation, have historically blunted energy growth, and that AI can itself optimise grids and cut emissions elsewhere. This is real but partial: efficiency lowers the intensity per computation, yet total demand still climbs because computation itself is exploding (the Jevons paradox (https://ujiyari.com/vocab/paradox/)).

HOW TO THINK ABOUT THIS (ANALYTICAL FRAME)

The transferable skill here is **decoupling (https://ujiyari.com/vocab/decoupling/) the digital from the dematerialised**. We instinctively treat "the cloud" as weightless, so we under-plan its physical claims. The sharp analytical move is to translate any digital ambition back into its unit inputs: kilowatt-hours, litres, hectares. Do that, and a policy question ("should India become an AI hub?") becomes a planning question ("do we have the firm power and non-freshwater cooling to host one?"). The same frame applies to electric vehicles (grid load), cryptocurrency (mining power) and desalination (https://ujiyari.com/vocab/desalination/) (energy for water).

THE DIAGRAM IN WORDS

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AI boom -> exploding compute -> data centres draw firm 24x7 power (448 TWh 2025 -> 945 TWh 2030) + freshwater for cooling -> sited in water-stressed, grid-constrained clusters -> competition with farms, households, industry -> if unplanned: local water stress + peak-power strain + emissions -> if planned: renewables-plus-storage supply, recycled/air/liquid cooling, water-secure siting -> sustainable digital infrastructure.
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WAY FORWARD

1. **Match compute with clean firm power.** Tie data-centre expansion to renewables plus storage and round-the-clock (RTC) clean-energy contracts, so new AI load does not lock in new coal.
2. **Mandate (https://ujiyari.com/vocab/mandate/) water-frugal cooling.** Incentivise closed-loop, air-cooled, liquid and immersion cooling; require treated/recycled water and set a Water Usage Effectiveness (WUE) benchmark, not just Power Usage Effectiveness (PUE).
3. **Site by resource, not just real estate.** Steer new clusters toward water-secure, renewable-rich zones through the data-centre policy and state incentives.
4. **Disclose and audit.** Require transparent reporting of energy and water use, so the footprint is measured before it is managed.
5. **Fund efficiency R&D.** Back indigenous chip efficiency, waste-heat reuse and grid-optimising AI to bend the demand curve.

PYQ LINKAGE AND PRACTICE

UPSC has repeatedly probed the resource dimension of technology and infrastructure, for example on the impact of digital technologies on the economy (2020), on water conservation and river-linking, and on energy security and renewables. The novel step this year is to fuse them: technology as a driver of energy and water demand.

Practice Mains question (GS3, 250 words, 15 marks): "The 'cloud' is among the most resource-intensive infrastructures of our time." In light of the projected surge in global data-centre power and water use, examine the sustainability challenges of India's AI and data-centre ambitions and suggest a policy framework to reconcile them with energy and water security.

Sources: Business Standard (https://www.business-standard.com/opinion)

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