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EDITORIAL ANALYSIS

The Hidden Cost of Chennai's Data Centre Boom: Water, Power and AI

DOWN TO EARTH

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Down to Earth 4 July 2026 GS3

Source: ujiyari.com — researched, fact-checked & UPSC-mapped

INTERVIEW ANGLE

"A single AI data centre can drink 20 lakh litres of water a day in a water-scarce city. How should India welcome the digital economy without letting invisible infrastructure quietly outbid citizens for water and power?"

Source: Original editorial ↗ Down to Earth

Every fact web-verified against primary sources (https://ujiyari.com/how-we-verify/)

THE LIFT LINE

> *"The cloud is not weightless. In a water-scarce city, every query you send has to be cooled, and someone, somewhere, pays for that water and power."*

Chennai is racing to become India"s **AI and data-centre hub**. But AI-grade data centres are extraordinarily **thirsty and power-hungry**, and their demand is colliding with a water-scarce city and a stressed grid. This editorial argues that the sustainability of **digital infrastructure** is a real resource-governance question, and that the cloud"s footprint has become very local.

WHY THIS EDITORIAL MATTERS FOR YOUR EXAM

GS Paper 3: Conservation and environmental degradation; water resources; energy; and the environmental impact of technology and infrastructure. It also touches GS Paper 2 (resource governance, regulation) and GS Paper 1 (urbanisation, water stress).

This theme lets you connect the AI and digital-economy story to water security, energy transition and urban planning, an unusually current and cross-cutting angle that examiners like because it forces synthesis rather than rote recall.

BACKGROUND AND CONTEXT

Data centres are the physical backbone of the digital economy: buildings full of servers that store and process data, and that must be **continuously cooled**, often with water. The arrival of **AI**, which relies on high-performance GPUs packed into dense racks, has sharply raised both the **power** and **cooling-water** demand per facility.

Chennai has emerged as one of India"s leading data-centre destinations, drawn by submarine-cable landings and connectivity. But Chennai is also a city with a **recurring water crisis** and summer power stress, which is why its data-centre boom raises a resource question that a technology-only story misses. More than **65 per cent** of India"s existing data-centre capacity is concentrated in just five cities: **Mumbai, Chennai, Hyderabad, Bengaluru and Noida**.

THE CORE ARGUMENT / ISSUE

The central claim is that the AI data-centre boom **exports a global digital footprint onto local water and power systems**, and that this must be governed, not left to commercial logic alone.

The Thirst and the Load

RESOURCE	SCALE OF DEMAND	WHY IT MATTERS FOR CHENNAI
Water	~20 lakh litres/day for a 100 MW hyperscale centre	Chennai has faced repeated acute water crises
National water use	~150 billion litres (2024-25), possibly ~358 billion litres by 2030	Fast-rising claim on scarce freshwater
Electricity	~13 TWh (2024) to ~57 TWh by 2030, nearly fivefold	Adds to summer heatwave grid stress
AI racks	Several times the power of conventional servers	Concentrated, intense load

Concentration Amplifies Stress

Because capacity clusters in a handful of cities, the resource burden is concentrated rather than dispersed. A water-scarce city can find an energy- and water-intensive industry quietly competing with households and farms for the same supply.

The Honest Counter

The industry's reply has real force. Chennai's **SIPCOT** clusters can use **treated sewage water** rather than groundwater; **seawater cooling, hybrid dry cooling and closed-loop liquid cooling** can cut water use sharply; and usage-based building controls can save **20-30 per cent** of energy. Data centres are also a strategic digital-economy asset. The gap is between what is technically possible and what is actually mandated: voluntary efficiency is not enforced sustainability.

HOW TO THINK ABOUT THIS (ANALYTICAL FRAME)

> *Digital services feel resource-free because their inputs, water and electricity, are hidden in a distant building. The analytical move is to convert a "tech" question into a "resource" question: how much water and power per unit of service, sourced from where, competing with whom? Once you price the invisible input, a data-centre boom reads as a water and energy decision, which is exactly how it should be governed.*

THE DIAGRAM IN WORDS

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AI boom -> dense GPU data centres need heavy cooling + power -> one 100 MW centre ~20 lakh litres water/day + AI racks draw multiples of normal power -> sited in Chennai (water-scarce, grid-stressed) + capacity concentrated in 5 cities -> competes with citizens and farms for water and electricity -> counter: treated sewage water + seawater/dry/liquid cooling + efficient controls (20-30% energy saved) -> but voluntary, not mandated -> fix: mandate efficient cooling + recycled water + renewable power + WUE/PUE reporting + siting rules -> digital growth planned as water and energy decision
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WAY FORWARD

1. **Mandate** (https://ujiyari.com/vocab/mandate/) **efficient, non-freshwater cooling.** Require treated or recycled water and water-efficient cooling (dry, seawater, closed-loop) for new data centres, especially in water-scarce zones.
2. **Power them with renewables.** Tie data-centre approvals to renewable-energy sourcing so the grid and climate footprint stays manageable.
3. **Demand transparency.** Require public reporting of Water Use Effectiveness (WUE) and Power Use Effectiveness (PUE) so citizens can see the real footprint.
4. **Plan siting and integration.** Apply strict siting rules in water-stressed cities and fold data-centre demand into municipal water and energy planning rather than approving it in isolation.

PYQ LINKAGE AND PRACTICE

- **UPSC GS3 (2020):** "What are the salient features of the National Water Policy of 2012? How is the National Water Framework Bill of 2016 different from it?"
- **UPSC GS1 (2023):** "Why is the world today confronted with a crisis of availability of and access to freshwater resources?"
- **UPSC GS3 (2018):** "'Access to the internet and mobile phones is not enough to bridge the digital divide.'" (digital infrastructure framing)

Practice Mains question (250 words, 15 marks): "The AI data-centre boom exports a global digital footprint onto local water and power systems. Using Chennai as a case study, examine the water and energy sustainability challenges of digital infrastructure and suggest a governance framework to balance the digital economy with resource security."

Sources: Down To Earth (https://www.downtoearth.org.in), Central Electricity Authority (https://cea.nic.in), Council on Energy, Environment and Water (https://www.ceew.in)

Source: The Hidden Cost of Chennai's Data Centre Boom: Water, Power and AI — Ujiyari.com | Free UPSC & State PCS Editorial Analysis

KEY ARGUMENTS AT A GLANCE

The rush to make Chennai India''s AI and data-centre hub carries a hidden environmental cost, because AI-grade data centres are extraordinarily thirsty and power-hungry, so their cooling-water and electricity demand collides with a water-scarce city and a stressed grid, making the sustainability of digital infrastructure a genuine environmental and resource-governance question, not just a technology story.

✓ SUPPORTING

- A single 100 MW hyperscale data centre can consume around 20 lakh litres (2 million litres) of water a day for cooling, in a city that has repeatedly faced acute water crises.
- India''s data centres are projected to raise electricity demand almost fivefold by 2030 (from about 13 TWh in 2024 to about 57 TWh), and AI racks draw several times the power of traditional servers, straining grids during heatwaves.
- Capacity is heavily concentrated in a few cities including Chennai, Mumbai, Hyderabad, Bengaluru and Noida, amplifying local resource stress rather than spreading it.

⚠ COUNTER

Industry argues that data centres are a strategic digital-economy asset and that the footprint is manageable: Chennai''s clusters can use treated sewage water rather than groundwater, and technologies like seawater, hybrid dry and closed-loop liquid cooling can sharply cut water use.

→ WAY FORWARD

Mandate water-efficient cooling and treated or recycled water, require transparent water and energy reporting (WUE and PUE), power data centres with renewables, apply strict siting rules in water-scarce zones, and fold digital infrastructure into water and energy planning.

MAINS ANSWER FRAMEWORK

QUESTION

"The AI data-centre boom exports a global digital footprint to local water and power systems." Examine with reference to Chennai and the sustainability of digital infrastructure. (250 words)

INTRODUCTION

The cloud feels weightless, but it is made of concrete, water and electricity. As Chennai races to become India''s AI and data-centre hub, the invisible infrastructure of the digital economy is landing very visibly on the city''s water supply and power grid, and the environmental cost is suddenly local.

BODY

The numbers explain the anxiety. A single 100 MW hyperscale data centre can consume around 20 lakh litres of water a day for cooling; India''s data centres used nearly 150 billion litres in 2024-25, potentially rising to around 358 billion litres by 2030.

Electricity demand from data centres is projected to grow almost fivefold by 2030, from about 13 TWh to about 57 TWh, and AI-ready racks draw several times the power of conventional servers. In a city that has faced repeated water crises and summer power surges, and where capacity clusters alongside Mumbai, Hyderabad, Bengaluru and Noida, this concentrates rather than disperses the stress.

The industry''s reply has merit: Chennai''s SIPCOT clusters can draw treated sewage water rather than groundwater, and seawater, hybrid dry and closed-loop liquid cooling can cut water use sharply, while usage-based controls can save 20-30 per cent of energy. But voluntary efficiency is not the same as enforced sustainability.

The real governance question is whether a data centre should be allowed to outbid citizens and farmers for scarce water and grid power without transparent reporting, renewable sourcing and siting rules. Digital growth must be planned as a water and energy decision, not treated as a purely commercial one.

CONCLUSION

Chennai''s data-centre boom shows the digital economy has a physical footprint that lands on local water and power. Welcoming it responsibly means efficient cooling, recycled water, renewable power and transparent reporting, so that AI''s growth does not come at the citizen''s tap or the farmer''s field.

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