AI Data Centres

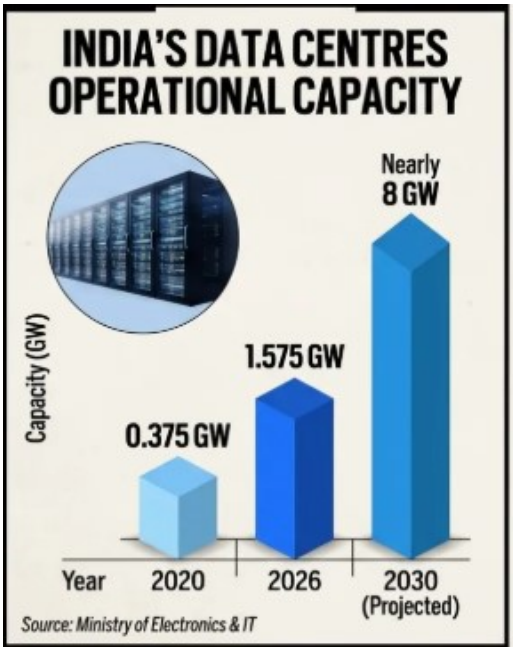
Mains: *GSIII – Science & Technology*

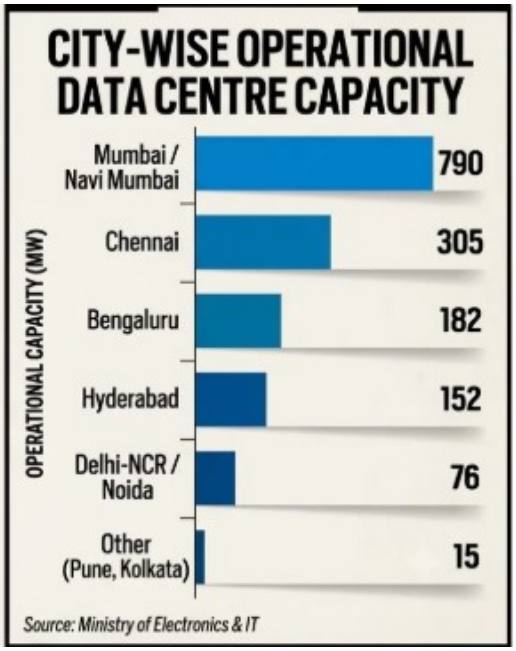
Why in News?

Recently there is a growing opposition to AI data centres over environmental concerns, resource consumption and limited local benefits, particularly regarding the proposed project in Visakhapatnam.

What are Data Centres?

- **Data centres** – These are physical facilities housing servers, computers, storage devices and cooling systems to store, process and manage digital information.
  - They provide the computing infrastructure supporting cloud services, internet applications, digital platforms and Artificial Intelligence.
- **AI Data Centres**
  - AI data centres use advanced computing infrastructure, particularly Graphics – Processing Units (GPUs), to train and operate Large Language Models (LLMs).
  - Growing AI applications have increased demand for inference, which involves computing required to generate responses to user prompts.





What is the Need for Data Centres?

- **Growing AI Adoption** – Increasing use of AI applications requires large-scale

computing and data-processing infrastructure.

- **Low Latency** – Locally situated data centres reduce delays in accessing digital services and processing information.
- **Data Sovereignty** – Domestic data storage enables countries to exercise greater control over data security, access and governance.
- **Digital Infrastructure** – They support cloud computing, financial services, businesses and digital governance.

Why Are AI Data Centres Facing Opposition?

- **High Electricity Consumption** – AI data centres require huge and uninterrupted electricity supplies for servers and cooling.
  - A typical AI data centre consumes as much electricity as 100,000 households (IEA).
- **High Water Consumption** –
  - Data centres use large amounts of water to cool servers.
  - This may reduce local water availability and affect drinking water supplies.
  - Advanced cooling systems reduce but do not eliminate water consumption.
- **Environmental Concerns –** Rising electricity demand may increase fossil fuel dependence.
  - Infrastructure development can affect groundwater, wildlife and local ecosystems.
  - Projects near reservoirs and wildlife sanctuaries raise ecological concerns.
- **Limited Local Employment** – Data centres generate thousands of construction jobs but create few permanent jobs.
  - A 150 MW facility may employ only slightly over 100 permanent workers.
- **Unequal Distribution of Costs and Benefits** – Businesses and distant users receive economic benefits, while local communities bear environmental costs.
  - This creates opposition known as the NIMBY (Not In My Backyard) phenomenon.
- **Concerns over Economic Priorities** – Large investments raise questions about the optimal use of scarce land, electricity and water.
  - The actual economic and social benefits of AI remain uncertain compared to its infrastructure costs. infrastructure and operational costs.

What is the Significance of Data Centres for India?

- **Strengthening Digital Infrastructure** – Data centres support India's growing digital economy, cloud computing ecosystem and AI-based services.
- **Data Sovereignty and Security** – Domestic data centres strengthen control over sensitive information, including financial, healthcare and government data.
- **Economic Growth and Investment** – They attract foreign investment, develop technological capabilities and create opportunities in construction, technology and clean energy.
- **Global AI Competitiveness** – Expanding domestic computing infrastructure can strengthen India's position in the global AI ecosystem.
- **Energy Infrastructure Development** – Investments in associated renewable energy projects can support electricity grid resilience and clean energy expansion.

What are the Challenges in Regulating Data Centres in India?

- **Absence of National Policy** – India lacks a comprehensive national data centre-specific regulatory framework, resulting in fragmented state-level policies.
- **Investment Competition** – States may engage in a race to attract investments by offering land, electricity and other concessions without adequate environmental safeguards.
- **Resource Allocation** – Data centres compete with households, agriculture and industries for scarce electricity, water and land.
- **Environmental Governance** – Inadequate public consultation and environmental scrutiny can undermine community participation and accountability.
- **Uncertain Benefits** – Limited permanent employment and uncertain social returns raise questions about the developmental justification of large projects.

What are to Measures to Ensure Sustainable Data Centre Development?

- **Develop a Comprehensive National Policy –** Establish a national regulatory framework covering land allocation, environmental clearances, energy consumption, and water use and community safeguards.
    - Harmonise state-level policies to prevent unhealthy competition and regulatory dilution.
- **Promote Green Data Centres –** Encourage renewable energy procurement, energy-efficient servers and advanced cooling technologies.
    - Promote direct-to-chip cooling and other resource-efficient cooling systems.
- **Ensure Sustainable Resource Management –** Mandate transparent disclosure of water and electricity consumption.
    - Encourage treated wastewater reuse and water-efficient cooling technologies.
    - Prevent excessive pressure on local electricity grids and drinking water supplies.
- **Encourage Efficient AI Infrastructure –** Promote smaller, task-specific AI models requiring less computing power.
    - Encourage decentralised computing networks and efficient hardware utilisation to reduce infrastructure requirements.
- **Strengthen Environmental Governance –** Ensure transparent environmental impact assessments and meaningful public consultations.
    - Assess cumulative impacts on groundwater, biodiversity, local ecosystems and electricity infrastructure.
- **Ensure Community Participation –** Involve local communities in project planning and approval processes.
    - Establish grievance-redressal mechanisms and ensure equitable sharing of economic benefits.

What lies ahead?

- India must balance AI infrastructure expansion with environmental sustainability, energy security and community welfare.
- Data centre development should follow the principles of resource efficiency, transparency, accountability and inclusive growth.
- Public acceptance and social legitimacy must become essential conditions for

approving large-scale AI infrastructure projects.

Reference

The Indian Express| why don’t people want AI Data Centres?

