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4. Environmental Cost of Ai - Environment

A United Nations report titled "Environmental Cost of Artificial Intelligence" highlights that by 2030, AI could consume 3% of the world's electricity, raising urgent questions about the sustainability of the global AI boom. Data centres could consume 945 terawatt-hours of electricity annually by 2030 — nearly triple the combined annual electricity use of Pakistan, Bangladesh, and Nigeria. AI-related water consumption could equal the basic annual domestic needs of 1.3 billion people, while AI infrastructure could generate up to 2.5 million tonnes of e-waste annually by 2030. More than 90% of AI-specialised computing capacity is concentrated in just two countries — the United States and China — raising serious environmental justice concerns.

1. Major Findings of the UN Report

Water and Power Consumption

1. AI could consume 3% of world's electricity by 2030
2. Data centres - 945 terawatt-hours annually by 2030 (nearly triple combined electricity use of Pakistan, Bangladesh, Nigeria)
3. AI-related water consumption could equal basic annual domestic needs of 1.3 billion people by end of decade
4. Water used primarily for - Data centre cooling systems, energy production for powering facilities

Water and Land Footprint

1. Every unit of electricity used by data centres carries -
    1. "Water footprint" - For cooling, energy production
    2. "Land footprint" - Associated with power generation, supply chains
2. Large-scale data centres requiring massive land acquisition
3. Competing with agricultural land, natural ecosystems

Electronic Waste

1. AI infrastructure projected to generate up to 2.5 million tonnes of e-waste annually by 2030
2. Components - GPUs, servers, cooling equipment, networking hardware with short replacement cycles
3. Much of this burden likely falling on lower-income countries with limited capacity for safe disposal
4. Hazardous materials (lead, mercury, cadmium) in e-waste threatening human health, ecosystems

Critical Minerals Concerns

Production of critical minerals needed for AI hardware (silicon, rare earths, cobalt, coltan) raising concerns about -

1. Environmental degradation in extraction regions
2. Social inequities (child labour, community displacement)
3. Land, water pollution from mining operations

Disparities and Environmental Justice

1. 90%+ of AI-specialised computing capacity - Concentrated in just two countries (US and China)
2. 150+ nations - Lack significant domestic AI infrastructure
3. Environmental justice imbalance -

1. Some countries bearing environmental costs (e-waste dumping, mining impacts)
2. Without sharing benefits of AI-driven economic growth
3. Perpetuating North-South inequality in digital economy

2. Environmental Impacts of AI Infrastructure

Carbon Emissions

1. Data centres powered largely by fossil fuels in many regions
2. Training large AI models (GPT-4, Gemini) consuming enormous energy
3. Example - Training a single large language model emitting CO_2 equivalent to multiple transatlantic flights
4. Contradicting corporate net-zero pledges

Water Stress

1. Data centres located in water-scarce regions competing with local communities, agriculture
2. Example - Google, Microsoft data centres in western US states facing criticism for water use during droughts
3. Groundwater depletion threatening long-term water security

Biodiversity Impact

1. Land clearing for data centres, power infrastructure destroying natural habitats
2. Mining for critical minerals (Congo Basin, Amazon) threatening biodiversity hotspots
3. Rare earth extraction creating toxic tailings, soil contamination

E-Waste Challenge

1. Rapid AI hardware obsolescence creating accelerating e-waste stream
2. Global e-waste **-** Already ~62 million tonnes annually (2022); AI accelerating this
3. Informal e-waste recycling in developing countries causing severe health impacts (respiratory diseases, cancer)

3. India's Relevance

India as AI Growth Hub

1. India rapidly expanding AI infrastructure (IndiaAI Mission, 38,000+ GPUs)
2. Data centre capacity growing significantly in Mumbai, Chennai, Hyderabad, Bengaluru, Pune
3. Becoming preferred destination for global data centre investments

Environmental Challenges

1. Growing data centre sector raising water stress concerns (already water-scarce regions)
2. India's electricity mix still heavily coal-dependent (~75%) — AI growth increasing carbon footprint
3. E-waste challenge - India already world's 3rd largest e-waste generator; AI hardware accelerating problem
4. Critical mineral mining (rare earths in Odisha, Jharkhand) raising environmental, tribal rights concerns

Opportunities

1. India's renewable energy ambitions (500 GW by 2030) can power green AI infrastructure
2. Tropical climate challenges for cooling can drive innovation in liquid cooling, free cooling technologies
3. India's circular economy initiatives can develop responsible e-waste management for AI hardware

4. Way Forward

Responsible AI Ecosystem Framework

The UN report outlines six principles -

1. **Transparency -** Disclose energy, water, land consumption of AI systems
2. **Efficiency by design -** Build AI systems minimizing resource consumption from inception
3. **Equity -** Ensure developing nations share AI benefits without disproportionate environmental burden
4. **Lifecycle responsibility -** Manage full lifecycle from mineral extraction to e-waste disposal
5. **Global cooperation -** International frameworks for sustainable AI governance
6. **Sustainable use -** Users choosing lower-impact applications where possible

Government Actions

1. Integrate AI infrastructure into energy, water, land-use planning
2. Mandate renewable energy sourcing for data centres
3. Establish e-waste extended producer responsibility for AI hardware manufacturers
4. Carbon pricing mechanisms incentivizing efficient AI design

Corporate Responsibilities

1. Design systems minimizing resource consumption
2. Commit to water-neutral, carbon-neutral data centre operations
3. Responsible critical mineral sourcing (conflict-free, environmentally sound mining)
4. Extend hardware lifecycles reducing e-waste generation

User-Level Actions

1. Choose lower-impact AI applications where possible
2. Avoid unnecessary AI queries with equivalent simpler solutions
3. Support platforms with transparent environmental disclosures

International Governance

1. UN-led framework for global AI sustainability standards
2. Technology transfer enabling developing nations to build efficient AI infrastructure
3. Environmental justice mechanisms ensuring equitable burden sharing
4. Align AI development with Paris Agreement climate commitments

5. Conclusion

UN report's findings — 3% global electricity consumption, 945 TWh data centre power, 1.3 billion people's water equivalent, 2.5 million tonnes e-waste annually by 2030, 90%+ AI capacity in US-China — reveal AI's profound environmental footprint demanding immediate governance response balancing technological innovation with planetary boundaries through transparency, efficiency, equity, lifecycle responsibility, and global cooperation.

Source - https -//news.un.org/en/story/2026/06/1167658