Southeast Asia's AI infrastructure boom demands stronger climate safeguards, SMU-led paper urges

A new paper led by the Singapore Green Finance Centre at SMU says that as AI infrastructure places increasing pressure on resources, developers and investors must chart a more sustainable path forward that benefits local communities

SINGAPORE, 13 Nov 2026 - As AI infrastructure in Southeast Asia (SEA) is projected to reach up to US$194 billion by 2030, the region has an opportunity to set the standard for a more sustainable future for AI. Beyond building data centres and expanding computing capacity, the region must ensure that AI infrastructure can withstand climate risks, use resources responsibly, and deliver benefits to local communities.

This is the key message of a new paper led by the Singapore Green Finance Centre (SGFC) at Singapore Management University (SMU), which explores how Southeast Asia can position itself for the next wave of AI growth while addressing climate adaptation, resource constraints and societal considerations. The paper is authored by Winston Chow, Lee Kong Chian Professor of Urban Climate at SMU; Karen Lai, Professor of Economic Geography at Durham University; and Felicia Liu, Senior Lecturer in Sustainability at the University of York.

The paper, entitled 'AI x Sustainability - Chapter 2 Climate Adaptation, Nature and Society,' is the second chapter of the five-part AI x Sustainability series, produced in partnership with Standard Chartered and Ecosperity. The series brings together perspectives from academia, industry and sustainability practitioners. Chapter 1, launched at Ecosperity Week in May 2026, introduced the series and explored the opportunities of AI development in Southeast Asia.

The AI conundrum

Across SEA, AI is already being applied to improve early-warning systems for floods and extreme weather, environmental monitoring, and the management of energy, water and other essential resources. Yet the infrastructure supporting AI is both exposed to and contributing to environmental pressures.

This presents a dual challenge. As developers and investors build digital infrastructure associated with AI, cloud computing, data centres, semiconductor manufacturing and digital services across the region, this critical infrastructure will also be increasingly exposed to extreme heat, flooding, tropical cyclones, drought, sea-level rise and ecosystem degradation, as most of East Asia and SEA is expected to grapple with more intense heavy rainfall and frequent flooding by 2050. AI infrastructure itself adds to the very pressures it must withstand through its operations and supply chains, widening the challenge of adaptation and mitigation.

What is vital as the region builds around this infrastructure is a comprehensive understanding of these issues, noted Professor Chow and Professor Lai. Said Professor Chow: "Investment in AI in SEA

must go beyond energy-efficient data centres. Climate resilience, water security, biodiversity and responsible supply chains are increasingly important considerations for long-term business viability. Through green finance, firms can help direct capital towards infrastructure that reduces environmental impacts while strengthening resilience to climate risks. The challenge is to ensure that AI-driven economic growth delivers lasting benefits for both businesses and the communities that support them."

"Policymakers, funders and developers need to simultaneously address climate risks, and the impact on local communities arising from energy and water consumption, land use, biodiversity loss, critical mineral extraction and hardware production," he added.

Bringing the benefit of AI investment to the people

In Singapore alone, the burgeoning data centre sector is expected to generate 7,000 direct employment opportunities and 17,000 jobs across the supply chain, according to AlphaBeta. In Malaysia, a KPMG study found a 4.2x multiplier effect, meaning that every direct operational role (such as a cloud architect, network engineer, or cooling technician) supports over three additional jobs in indirect sectors such as civil engineering, construction, retail and utilities.

The current boom is also shifting investments towards emerging regional hubs, namely Johor (Malaysia), Batam (Indonesia) and Bangkok (Thailand). This geographic expansion has the potential to bring more high-tech employment, creating a need for localised expertise that combines technical engineering skills with country-specific regulatory and cultural fluency.

The research team recommends three pathways for the use of AI to improve climate adaptation strategies:

a) **Help SEA better manage water and energy resources:**
AI can improve weather forecasting, predict floods and support better management of water and energy. These applications could help governments and businesses prepare for extreme weather and manage resources more effectively.

b) **Make AI infrastructure sustainable beyond the data centre itself:**
Data centres depend on electricity, water, land and hardware produced through global supply chains. Their environmental impact extends beyond their immediate operations. Planning must consider these wider impacts, including pressure on natural resources and local communities.

c) **Ensure AI investment creates opportunities and minimises disruption for local communities:**
The growth of AI infrastructure can create jobs, develop new skills and attract investment but the benefits may not be shared equally. Local communities can face greater pressure on water, electricity and the natural environment. Their interests must be considered in development decisions.

Recommendations for SEA on climate adaptation in the age of AI growth

Arising from these, the team outlines six priority areas for action:

1. **Assess the full impact of AI infrastructure**: Look beyond data centres to include the energy, water, land, and materials required to build, operate, and eventually retire AI systems.
2. **Set clear standards for sustainable AI infrastructure**: Establish common ways to measure energy and water use, climate resilience and impacts on nature, so that progress can be tracked and compared.
3. **Invest in infrastructure that can withstand climate risks**: Prioritise resilient facilities, more efficient cooling and water reuse to reduce environmental pressures and prepare for a changing climate.
4. **Give communities a voice in AI development**: Involve local communities early as key stakeholders, share information transparently and take their concerns into account before major infrastructure decisions are made.
5. **Build the skills needed for a sustainable AI future**: Equip local workers and communities with relevant skills through training and partnerships between governments, universities and industry.
6. **Ensure local communities share in the benefits**: Turn AI investment into tangible local gains through jobs, training, business opportunities and community investment.

Professor Lai believes that the growth of AI infrastructure offers SEA significant opportunities to create skilled employment, develop new capabilities and capture more value from the digital economy. “Realising this potential will require investing in skills training, strengthening local participation in supply chains, and ensuring that communities share in the benefits of digital growth while environmental and social impacts are managed responsibly," she elaborated.

A multi-disciplinary effort

In conclusion, Ms Nikki Kemp, Centre Director of SGFC, emphasised there is a real opportunity for SEA sustainability.

“This will require a coordinated response from policymakers, financiers and industry. In this paper, we are fortunate to have thought leadership from Winston, Karen and Felicia’s extensive research into AI infrastructure, as well as industry expertise from Standard Chartered (one of SGFC’s founding partners) and Ecosperity. Contributions from experts with different perspectives in this five-part series represent the kind of multidisciplinary thinking we need to examine the duality of AI and sustainability, and the opportunities it presents for SEA,” she shared.

The paper ‘AI x Sustainability - Chapter 2 Climate Adaptation, Nature and Society,’ is available here

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About the Singapore Green Finance Centre (SGFC)

SGFC was established in 2020 as Singapore’s first Centre of Excellence dedicated to advancing Asia-focused sustainable finance and investment. Managed by Singapore Management

University, SGFC is supported by the Monetary Authority of Singapore and seven leading financial institutions: BNP Paribas, Goldman Sachs, HSBC, Schroders, SMBC, Standard Chartered Bank and UBS AG. The Centre develops high-impact research, facilitates collaboration across academia, industry and policy, and builds capabilities to support resilient economic growth in Asia. https://www.singaporegreenfinance.com/

About Singapore Management University (SMU)

Established in 2000, Singapore Management University (SMU) is recognised for its high-impact, multi-disciplinary research that addresses Asian issues of global relevance, and for its interactive, collaborative and project-based approach to learning. Home to over 13,000 students across six schools and two colleges, SMU offers bachelors, masters and PhD programmes across Accountancy, Business, Economics, Information Systems, Integrative Studies, Law and Social Sciences, as well as executive development and continuing education programmes. SMU graduates are consistently ranked among the most employable in Singapore, and command one of the highest mean starting salaries. Through its city campus, SMU enjoys strategic linkages with business, government and the wider community in Singapore and beyond. www.smu.edu.sg

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