REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

POLICY BRIEF

Strengthening Research Computing Infrastructure in Kenya



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1. INTRODUCTION

Research computing covers the processors, storage, networks, software and specialist staff that scientists need to run simulations, analyse large datasets and train artificial intelligence (AI) models. High-performance computing (HPC) clusters and graphics processing units (GPUs) sit at its core. Many large genomic, climate and language-modelling workloads exceed what a laptop or departmental server can handle. Where researchers cannot reach suitable capacity, they scale down their questions or send their data abroad for processing.

Many governments now finance research compute as shared national infrastructure. The United States launched the National AI Research Resource (NAIRR) pilot in January 2024 with 25 private-sector partners, giving researchers access to federal supercomputers and donated cloud capacity (National Science Foundation, 2024). The European Union's EuroHPC Joint Undertaking offers its AI Factories free of charge to eligible researchers in Europe through peer-reviewed calls (EuroHPC Joint Undertaking, 2025). India took a different route: by April 2026 its AI Mission had onboarded more than 38,000 GPUs from private providers through a common compute portal and offers them to Indian start-ups and academia at subsidised rates (National e-Governance Division, 2026). India pays for access to pooled capacity; it does not own most of the hardware.

Africa holds less than one per cent of global compute capacity and roughly 0.2 per cent of global AI compute located on its own soil (Xalam Analytics, 2026). South Africa is the exception. Its Centre for High Performance Computing (CHPC) commissioned Africa's first petascale system in 2016 and is installing a new 4-petaflop national system (Sithole, 2026). Kenyan researchers are among the largest African users of the CHPC.

Kenya already has more research computing than is often assumed. The Kenya Education Network (KENET) runs the CHUI HPC cluster and an expanded GPU cluster launched in March 2026 (KENET, 2026; UbuntuNet Alliance, 2026). NACOSTI hosts two racks of the former Stampede supercomputer, received in 2019 through the CHPC's HPC Ecosystems Project for partner countries of the Square Kilometre Array (NACOSTI records). The Kenya National AI Strategy 2025–2030 commits to three AI-capable data centres and a national AI HPC cluster (Ministry of ICT and Digital Economy, 2025a). This policy brief looks at how these assets, and the ones planned, can become dependable, affordable and fairly shared compute for the Science, Technology and Innovation (STI) sector.

2. RATIONALE

Computing power now limits what Kenyan science can attempt in genomics, crop breeding, earth observation, materials modelling and AI. The National AI Strategy records that insufficient computing power, broadband connectivity and energy efficiency hinder large-scale AI work in Kenya, and that the country relies heavily on foreign data centres to process and store data produced in Kenya (Ministry of ICT and Digital Economy, 2025a).

Foreign processing is lawful in many cases. The Data Protection Act allows transfers outside Kenya subject to safeguards, with extra conditions for sensitive personal data (sections 48 to 50), and the 2021 General Regulations require local processing only for a short list of state purposes (Government of Kenya, 2019; Government of Kenya, 2021). But dependence still carries costs. Commercial GPU time is priced in US dollars and is beyond most research grants. Researchers have less control over where sensitive health and genomic data sit and who can reach them. And capacity that Kenya does not control can be repriced, rationed or restricted by export controls on advanced chips, a risk the National AI Strategy names directly.

Public spending on research and development stands at about 0.8 per cent of GDP (NACOSTI, 2024). On budgets this tight, each institution buying and running its own small cluster duplicates cost and leaves equipment under-used. A national research computing service, built on assets Kenya already holds and governed by clear rules on access and financing, would get more science from each shilling. This brief sets out the options for such a service and the decisions needed first.

3. SITUATIONAL ANALYSIS

KENET operates the main shared research computing services for universities and research institutes. Its CHUI cluster offers CPU and GPU resources with the Slurm workload manager, shared high-performance storage and multi-user access for members of the KENET community (KENET, 2026). The expanded GPU cluster launched in March 2026 has four servers with two NVIDIA A30 GPUs each and cost about US$1 million, with European Union support through AfricaConnect3 (UbuntuNet Alliance, 2026). KENET offers these services to members free of charge. An earlier user report for its GPU service counted 14 users, most of them postgraduate students (Otuya-Oyim, n.d.).

NACOSTI's Stampede system shows both the demand and the constraints. The two racks hold 80 Dell compute nodes. CHPC engineers installed the OpenHPC software stack with Slurm in June 2023 and recommended three-phase power, backup power and better cooling before full use. A pilot on four of the 80 nodes opened to researchers in early 2024, with first users from the Technical University of Kenya, KEMRI, Masinde Muliro University and KALRO. By September 2024 the pilot had served 16 researchers and delivered about 76,000 compute hours, running the four nodes at full use. In May 2026 the system was still in pilot, with the remaining nodes idle because the server room lacks the power and cooling to run them (NACOSTI records). The hardware is CPU-based and about a decade old, so it complements GPU services rather than replacing them.

A few research institutes, such as the International Livestock Research Institute (ILRI) and KALRO, run their own clusters for genomics and agricultural data (Orth, 2023). Most public universities and county-based research centres have no direct HPC access.

Commercial capacity is growing. Kenya had 13 colocation data centres with about 20 MW of IT load in 2025, with around 200 MW more in the pipeline (Research and Markets, 2025). Cassava Technologies, an NVIDIA cloud partner, announced in November 2025 a GPU-as-a-Service offering from its data centres in five African countries, Kenya among them (Cassava Technologies, 2025), and the Nairobi AI Forum in February 2026 mobilised 1.5 million GPU hours for African innovators (UNDP Kenya, 2026). This review did not find a standing research allocation in any of these offers.

Power reliability and cost are material constraints on siting and running compute. About 80 per cent of Kenya's electricity generation in 2024/25 came from renewable sources, with geothermal alone supplying about 40 per cent (EPRA, 2025). Peak demand reached 2,439 MW in December 2025 (EPRA, 2026a). The proposed US$1 billion Microsoft and G42 geothermal data centre, announced in May 2024, stalled in 2026 after the companies sought government guarantees to pay for a set amount of capacity each year (Bloomberg, 2026). Since May 2026, the Electricity Market, Bulk Supply and Open

Access Regulations allow consumers drawing 1 MVA or more from the distribution network to buy power directly from generators (EPRA, 2026b). The National Optic Fibre Backbone reaches all 47 counties.

4. METHODOLOGY

This policy brief is based on desktop research covering sources published up to 30 June 2026. It reviewed national policy and legal documents, including the National AI Strategy 2025–2030 and its December 2025 Implementation Roadmap, the Data Protection Act and the STI Act; NACOSTI's records on its HPC pilot; KENET's published service information; electricity statistics from the Energy and Petroleum Regulatory Authority (EPRA); and research compute programmes in South Africa, the European Union, India and the United States, chosen because they finance and allocate shared compute in different ways. Primary sources were preferred over news reports, and announcements were not treated as evidence of services in operation. No stakeholder survey was carried out, and the brief does not estimate national demand or costs; recommendation 10 proposes how both should be established. Sources are listed in the References section.

5. FINDINGS

5.1 Capacity Is Scattered and Under-used

Kenya's shared research compute is spread across KENET's services, NACOSTI's Stampede pilot, a few institutional clusters and access to the CHPC in South Africa. No one holds a full inventory of these assets or of the demand for them. The Stampede pilot shows that demand exists: four nodes reached full use within months of opening, through personal contacts and without publicity (NACOSTI records). It also shows that equipment can sit idle for years when power, cooling and staff are not funded with it. Seventy-six of its 80 nodes have not yet been brought into service.

5.2 Running Costs Decide Whether Facilities Work

Research compute is usually bought project by project with capital or donor funds, while the costs that keep it running fall on host institutions with no budget line for them. NACOSTI's experience with the Stampede racks illustrates the pattern: an internal estimate put annual running costs at several times the set-up cost, mainly bandwidth, software licences and electricity (NACOSTI records). Those figures are dated and specific to that system, but the balance between capital and running costs is typical. Staff matter as much. The pilot relied on external expertise to set up and administer the system (NACOSTI records).

5.3 Options for Delivery

Four broad options are open. The first is to expand existing shared facilities, chiefly KENET's services and NACOSTI's Stampede system; this builds on existing expertise and connectivity, but capacity and sustainable funding must be tested. The second is to federate institutional clusters under common access rules, which uses existing assets but requires agreements on governance and interoperability. The third is to buy research access or credits from Kenyan data centres and cloud providers, as India does; this needs less up-front capital but brings questions of price, continuity and lock-in. The fourth is a hybrid national service that combines a secure core for sensitive data with federated and purchased capacity for other work. This brief favours the hybrid option, subject to the costed appraisal proposed in recommendation 10. A new stand-alone agency is not proposed.

5.4 Policy and Legal Foundation

The STI Act, Cap. 511, allows the National Research Fund (NRF) to finance "the acquisition or establishment of research facilities" and to promote "an information infrastructure linking research institutions" (sections 33 and 36). The National AI Strategy sets flagship projects for HPC clusters, AI-capable data centres and green energy for digital infrastructure, and the Ministry published an Implementation Roadmap for the Strategy in December 2025 (Ministry of ICT and Digital Economy, 2025b). The Data Protection Act, Cap. 411C, and the Kenya Cloud Policy set data protection and data residency expectations, and the 2026 Open Access Regulations open a route to direct power purchase. What is missing is a research-specific instrument that sets out who may use national research compute, on what terms, and how it is paid for and secured.

6. CHALLENGES

Five clusters of challenges stand between Kenya's current position and dependable research compute.

- **Fragmented and under-used assets.** Shared capacity sits with a few providers, institutional clusters are small and closed, and NACOSTI's Stampede system runs at a fraction of its size. Most universities and county-based research centres have no direct access.
- **Power and cooling.** Facilities need reliable supply, backup and cooling before they can scale. Tight national supply and outages raise the cost of meeting these needs (EPRA, 2026a; Bloomberg, 2026).
- **Financing.** No recurrent budget covers power, staff, licences, connectivity and hardware renewal. Hardware is priced in dollars, and research grants rarely include compute costs.
- **Skills.** Few institutions employ HPC systems administrators or research software engineers, and many researchers lack training in parallel and GPU computing.
- **Data security and supply risk.** Sensitive research data need controls wherever they are processed, and access to advanced GPUs is exposed to export controls and supply shortages (Ministry of ICT and Digital Economy, 2025a).

Table 1: Research Computing Gaps, Proposed Instruments and Lead Agencies

Gap	Proposed Instrument	Delivery Mechanism	Proposed Lead (Support)
Category A: Governance and Access			
No common arrangement for shared research compute	National Research Computing Service	Accredited providers under common access rules	State Department for Science, Research and Innovation (NACOSTI, NRF, KENET)

Gap	Proposed Instrument	Delivery Mechanism	Proposed Lead (Support)
No common rules on who gets compute time	Research compute access policy	Peer-reviewed allocation calls with published usage reports	NACOSTI (NRF, providers)
No verified inventory of assets or demand	National asset register and demand assessment	Survey of research institutions and providers	NACOSTI (KENET, research institutions)
Category B: Infrastructure, Energy and Security			
Idle nodes on NACOSTI's Stampede system	Power, cooling and backup upgrade or colocation	Facility upgrade or hosting agreement	NACOSTI (KENET, host partner)
No reserved research share in national AI data centres	Research allocation in national AI HPC capacity	Conditions in National AI Strategy flagship projects	Ministry of ICT and Digital Economy (NACOSTI)
Unreliable and costly power	Priority supply and direct power purchase	Supply agreements under the 2026 Open Access Regulations	Ministry of Energy and Petroleum, EPRA (host institutions)
No agreed controls for sensitive research data	Secure research environment	Data classification, access control and audit standards	Providers (ODPC in an advisory role)
Category C: Financing and Skills			
No costed investment case	Costed options appraisal	Lifecycle costing of the four delivery options	NRF (NACOSTI, National Treasury)
No recurrent budget; grants exclude compute	Tiered cost-sharing and compute budget lines	Exchequer, NRF, institutional, partner and user contributions	NRF (National Treasury, development partners)
Shortage of HPC staff	Shared HPC administrators and research software engineers	Posts funded through the national service	Providers (universities, KENET)

7. POLICY RECOMMENDATIONS

Fourteen recommendations are grouped under four themes. They are staged: the first steps verify assets and demand and bring existing equipment into full use; larger investments follow once a costed appraisal and the access rules are in place.

Theme A: Governance and Access

- **Establish a National Research Computing Service.** The service should give universities, research institutes, private research entities and county-based researchers one route to national research compute, delivered through accredited providers such as KENET and NACOSTI and governed by common access rules. It should be a coordinated service, not a new agency, with a governing board drawn from research institutions, funders and government. The Office of the Data Protection Commissioner should advise the board rather than sit on it, to keep the regulator independent of the services it may oversee.
- **Adopt a research compute access policy.** Compute time should be allocated through open, peer-reviewed calls with separate routes for start-up and exploratory use, standard research projects, and national priority programmes. To keep allocations fair, calls should offer help with applications, apply conflict-of-interest rules, allow appeals and publish success rates by type of institution.
- **Set priority research areas.** Calls should reserve capacity for health and genomics, agriculture and food security, climate and earth observation, Kenyan language AI, and materials and energy research.
- **Build a verified register of assets and demand.** Research institutions and providers should report the compute they hold, its condition and use, and the demand they cannot meet, so that later investment rests on evidence rather than vendor proposals.

Theme B: Infrastructure, Energy and Security

- **Bring NACOSTI's Stampede system into full use.** The Commission should fund three-phase power, cooling and backup for its server room, or agree to host the racks at a facility that already has them, so that the remaining 76 nodes can serve researchers while newer capacity is planned.
- **Reserve research capacity in national AI infrastructure.** The AI-capable data centres and national AI HPC cluster proposed in the National AI Strategy should each set aside a defined share of capacity for publicly funded research, allocated through the national service.
- **Pilot federation before scaling it.** Institutional clusters should be linked to the national service first on compatible workloads, with provider agreements covering identity, scheduling, accounting, security, support and the terms on which capacity can be withdrawn.
- **Secure reliable and affordable power.** Energy authorities should give research compute facilities priority supply and backup arrangements. Facilities that meet the threshold should use the 2026 Open Access Regulations to contract geothermal or other renewable power directly.
- **Set up a secure research environment for sensitive data.** Providers handling health, genomic and other sensitive data should apply data classification, role-based access, encryption, audit logs, incident response and clear retention and deletion rules. Hosting data in Kenya helps with control, but it does not by itself ensure compliance with the Data Protection Act.

Theme C: Financing and Partnerships

- **Commission a costed appraisal before major purchases.** The NRF, working with NACOSTI and the National Treasury, should cost the four delivery options over their full life: hardware, storage, networking, power, cooling, licences, staff, security, maintenance, renewal and exchange-rate risk. Capacity should then grow in phases, sized from the register and from measured use.
- **Adopt a tiered cost-sharing model.** Publicly funded research should receive compute free or subsidised at the point of use, paid for by the Exchequer, the NRF and member institutions. Private research entities and start-ups should pay a subsidised rate and commercial users full cost, with fees returned to operations. Grants from the NRF and development partners should allow a compute budget line, and the national service should prevent double charging or double subsidy.
- **Buy access where owning is not justified.** The service should negotiate research rates or credits with Kenyan data centres and cloud providers for workloads that exceed its own capacity, and formalise access agreements with the CHPC, while keeping sensitive Kenyan data under Kenyan jurisdiction.

Theme D: Skills and Inclusion

- **Fund shared research computing staff.** The national service should fund HPC systems administrators and research software engineers who support several institutions, run training in parallel and GPU computing, and coordinate with the companion brief on an inclusive AI research workforce.
- **Track inclusion in access.** Allocations and training should report participation by gender, career stage and type of institution, with targets set once the register provides a baseline.

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