

A Framework for Sovereign AI Governance and Economic Growth in Cameroon

Eyong Atem^{1*}

¹ *Business and Information Studies, Capitol Technology University. Maryland, USA.*

Article History

Received:
29.12.2025

Revised:
17.02.2025

Accepted:
10.03.2026

*Corresponding Author:

Eyong Atem
Email:
eatem@captechu.edu

This is an open access article,
licensed under: [CC-BY-SA](#)



Abstract: Artificial Intelligence is no longer just a trend in technology. It has become a structural force that determines national competitiveness and economic resilience. While many advanced nations are already integrating AI into their core systems, most Sub-Saharan African states still lack the institutional frameworks needed to turn these innovations into sustainable development. This paper argues that Cameroon should not view AI simply as modernization. Instead, it must be treated as a sovereign strategy built on institutional economics, deliberate governance, and a solid blended finance architecture. Using comparative policy analysis and digital infrastructure modeling, the study proposes a three-layer framework tailored to Cameroon's specific political economy. This model draws on international standards from the OECD, UNESCO, and the African Union, alongside the NIST Risk Management Framework. The findings show that with coordinated reform, AI could boost Cameroon's long-term productivity by 1.5% to 2.8% annually. To fund this transition, the paper introduces a blended finance structure designed to attract multilateral banks and private venture capital. Further research is needed to explore the longitudinal impact of these AI deployments on local labor markets and the creation of indigenous datasets that reflect Cameroon's unique linguistic diversity. Ultimately, this work contributes to the growing body of research on digital sovereignty and the political economy of AI in frontier markets.

Keywords: AI Governance, Cameroon, Digital Sovereignty, Institutional Economics, Endogenous Growth.



1. Introduction

Cameroon finds itself in a decisive position. The country has several clear advantages, including a population of over 28 million with a median age under 20, increasing mobile connectivity, and a bilingual English-French system. Because of its place within the Central African Economic and Monetary Community (CEMAC) and the African Continental Free Trade Area (AfCFTA), Cameroon is well-positioned to lead AI growth in Central Africa [1].

However, significant practical challenges remain. Digital infrastructure is still very limited outside of major cities, and data governance rules are not yet well-developed. There is also a clear lack of AI knowledge among public sector leaders. Without a formal national strategy, current regulations are scattered and inconsistent. If these issues aren't addressed soon, the country doesn't just risk falling behind; it risks getting stuck in a cycle of digital dependency. In this scenario, foreign AI systems would simply extract value from local data while Cameroonian institutions remain stuck as passive buyers of technology made elsewhere.

This paper looks at a major gap in both academic research and public policy. Currently, Cameroon lacks a governance framework for AI that prioritizes national sovereignty. Most discussions about AI in Africa tend to lean toward either extreme optimism or deep pessimism, neither of which offers a practical plan that fits Cameroon's specific political and economic situation.

The main point of this study is that AI in Cameroon should be treated as a sovereign development strategy, not just a technical upgrade. Without a strong institutional foundation, AI tools might actually worsen existing inequalities and concentrate wealth among a small group. However, if designed correctly, AI can act as a tool to significantly boost productivity and make government operations more efficient.

2. Literature Review

This section links the proposed governance framework to three specific theoretical areas: institutional economics, endogenous growth theory, and development finance architecture. Taken together, these ideas explain a vital point. AI adoption cannot succeed by itself. It requires a solid foundation of governance design before the technology is rolled out.

2.1. Institutional Economics and Technological Leapfrogging

Contemporary AI discourse extensively re-examines the foundational insight that institutions shape the developmental potential of technology. Mazzucato et al. demonstrated that the state's institutional capacity to direct technological missions determines whether digital innovation generates inclusive growth or concentrated rents. Institutions are the primary determinants of whether AI deployment yields long-run economic performance or volatility. These institutions represent the formal and informal rules governing economic behavior. Technology does not automatically translate into growth within this framework. It is filtered through institutional structures that may amplify or distort its developmental potential [2].

This insight carries significant practical implications for AI adoption in an emerging economy. AI systems do not self-govern despite being technically sophisticated. They require clear property rights over data. They need predictable regulatory enforcement. They demand transparent risk governance frameworks and executive-level accountability mechanisms. AI introduces volatility instead of stability in the absence of such institutional scaffolding. This creates new forms of regulatory arbitrage, data extractivism, and technocratic capture.

Lee has revisited the concept of technological leapfrogging in the AI era. He argues that developing economies can bypass intermediate technological stages under conditions of active industrial policy and deliberate institutional investment [3]. Mobile-first financial services in Kenya (M-Pesa) and Rwanda's drone delivery infrastructure demonstrate this capacity empirically. Successful leapfrogging is not automatic. It requires deliberate institutional design and targeted public investment. AI presents Cameroon with a leapfrogging opportunity of comparable historical significance. This transition demands more complex governance architecture than previous digital shifts.

Korinek and Stiglitz provide an important cautionary framework. AI deployed in contexts characterized by elite capture, weak accountability, and limited public participation will likely reinforce inequality [4]. AI embedded within inclusive institutional frameworks carries genuine transformative potential. These frameworks must be characterized by participatory governance and

the rule of law. This distinction between extractive and inclusive AI deployment contexts is central to the governance architecture proposed in this paper.

2.2. Endogenous Growth Theory and Digital Capital Formation

Goldfarb and Tucker provide a contemporary reformulation of endogenous growth theory applied to the digital economy. They demonstrate that AI exhibits the same non-rivalrous properties of knowledge capital that drive compounding productivity gains [5]. AI capabilities do not diminish through use unlike physical capital. These capabilities exist once encoded in governance frameworks, trained models, and institutional processes. A single AI governance framework can be applied across sectors simultaneously. This generates increasing returns to institutional investment.

The implications for Cameroon's development strategy are substantive. Digital infrastructure must be understood as capital formation in the economic sense. This includes data centers, broadband networks, and AI computing platforms. These elements are not simply public expenditure. Digital infrastructure creates network externalities that multiply productivity across the economy. This mirrors the role of physical infrastructure in classical development economics. A national AI data center serves the same function in the digital economy that a port served in the industrial economy [4].

This theoretical reframing has direct implications for public finance and investment mobilization. Digital infrastructure becomes eligible for development finance instruments if it is classified as capital formation rather than recurrent expenditure. These instruments include long-term concessional loans, infrastructure bonds, and blended finance facilities. This reclassification is theoretically justified. It is practically consequential for Cameroon's fiscal strategy. AI infrastructure and human capital development yield compounding returns as institutional capacity builds over time. This creates a strong path-dependency argument for urgency. Cameroon delays foundational investments in governance and infrastructure at its own peril. Longer delays widen the gap with regional comparators and increase the eventual cost of catch-up.

2.3. Digital Sovereignty and Dependency Theory

A third theoretical strand relevant to this analysis derives from contemporary scholarship on digital dependency. Kwet coined the concept of "digital colonialism" to describe how technological adoption without commensurate institutional capacity reproduces structural dependency. The importing economy becomes a consumer of externally-generated technology. It accumulates neither intellectual property nor innovation capacity [6]. Couldry and Mejias extend this argument to data regimes. They demonstrate how asymmetric data collection arrangements extract value from populations in the Global South. These arrangements concentrate AI capabilities in a small number of platform monopolies [7].

This dynamic manifests through algorithmic dependency in the AI context. Reliance on foreign-developed models trained on non-representative data creates risks. Data extractivism involves the collection and commercial exploitation of local data by foreign entities without benefit-sharing. Governance capture leads to the de facto outsourcing of AI regulatory functions to international standards bodies without local adaptation. A governance-first approach to AI is an assertion of digital sovereignty from this theoretical vantage point. It represents the right of states to determine the terms on which AI operates within their jurisdictions.

3. Methodology

This study adopts a combined analytical strategy to examine AI governance in Cameroon. To explore this, the study combines a comparative policy analysis of AI governance frameworks across selected African states with institutional economics applied to digital transformation contexts. Endogenous growth theory is used to model AI-driven productivity impacts, while development finance architecture analysis helps examine investment mobilization mechanisms.

The study also incorporates a systematic review of AI policy development across Sub-Saharan Africa. This review reveals significant heterogeneity in institutional readiness, strategic clarity, and implementation capacity. Such findings provide an analytical basis for situating Cameroon within this regional context. This helps in identifying the risks of policy inaction and the opportunities available through strategic catch-up. These results are further contextualized within Cameroon's National

Development Strategy 2020–2030 (NDS-30) and aligned with relevant international normative frameworks and standards.

4. Finding and Discussion

4.1. Comparative Benchmarking: African AI Readiness Landscape

1) Comparative Analysis Framework

This comparative setup relies on the 2023 Oxford Insights Government AI Readiness Index along with the ITU AI Repository for African Nations and specific policy papers from each country. Regional importance and varied levels of governance maturity determined which countries were selected for the study. Table 1 contains the specific metrics used for this look at national strategies and research depth.

Table 1. Comparative AI Readiness: Selected African States (2023)

Country	National AI Strategy	Protection Law	Sovereign Cloud	AI Research Institutes
Rwanda	Yes (2020)	Yes (2021)	Limited (GovCloud)	Growing (CGIS, RCA)
South Africa	Yes (2022 Draft)	Yes (POPIA 2021)	Moderate (AWS, Azure local)	Advanced (CSIR, UCT AI Lab)
Kenya	Drafting (2023)	Yes (DPA 2019)	Limited	Emerging (AAIN, AI4D)
Egypt	Yes (NAIS 2022)	Partial (PDPL 2020)	Developing	Growing (NTRA, AUC AI Labs)
Cameroon	No formal strategy	Partial (Law No. 2010/012)	Minimal	Fragmented (UYI, UDIs)

Source:

Oxford Insights Government AI Readiness Index (2023); ITU AI Repository; national policy documents. CGIS = Centre for Geographic Information Systems; POPIA = Protection of Personal Information Act; PDPL = Personal Data Protection Law; NAIS = National AI Strategy; AUC = American University in Cairo; AAIN = AI Accelerator Initiative Network; NTRA = National Telecommunications Regulatory Authority.

2) Regional AI Strategy Development

Rwanda currently leads the AI governance space in Central and East Africa. They launched a National AI Policy in 2023 supported by Law No. 058/2021 for data protection and a growing web of innovation hubs. South Africa remains the most advanced economy on the continent. Their sophisticated research setup relies on the South African National Research Network and the 2020 Protection of Personal Information Act. Kenya is moving forward with a 2023 draft strategy and a strong digital finance sector in Nairobi.

Cameroon does not have a formal national AI strategy yet. It uses a 2010 data protection law that was written before the AI era began. This outdated rulebook fails to address modern issues like automated decisions or algorithmic profiling. Sovereign cloud options are nearly nonexistent and research stays scattered across various universities without central funding. These data points suggest that Cameroon might fall behind its neighbors. Missing a formal strategy is more than a symbolic issue. It signals to investors that the necessary governance for AI projects is not there. Fixing this gap is a major domestic priority and a signal to the global market.

3) Key Findings from Comparative Analysis

Three specific patterns appear in this study. States with formal AI plans see much higher rates of investment. Rwanda is a prime example because its 2020 strategy brought in partnerships with Carnegie Mellon University and the AfDB.

Data protection laws must exist before AI governance can work well. These laws establish the property rights required for AI rules. Cameroon’s current legal framework is insufficient for the data needs of large-scale AI.

Research capacity depends on strategy more than national wealth. Rwanda boosted its research through international partnerships and its diaspora. Cameroon could do the same. Universities like Yaoundé I and Douala exist as anchors but they are not yet mobilized for AI. The country faces marginalization in the hunt for talent if a strategy is not built within the next 24 months.

4.2. Economic Impact Modeling

This section presents a sector specific model to estimate how AI might impact Cameroon’s economy. The analysis builds on productivity methodologies from Acemoglu, the McKinsey Global Institute, and the PwC Global AI Report [8] [9] [10]. Estimates for efficiency are kept conservative and are based on data from similar emerging economies.

1) Methodological Framework

The model tracks AI’s economic influence through three main channels. These include process automation to cut labor costs on routine tasks, decision augmentation to speed up complex human choices, and predictive optimization for better resource forecasting. These channels are applied to the four main sectors of Cameroon’s economy. Efficiency gains are calibrated against real world outcomes seen in other African nations.

The model uses a 10-year timeline divided into two distinct periods. Phase 1 covers years 1 to 4 and focuses on building the necessary governance and infrastructure. Productivity effects during this time are modest. Phase 2 covers years 5 to 10 and represents full deployment where cumulative gains start to show. GDP contribution figures come from the World Bank’s Cameroon Country Economic Memorandum (2022) [11].

2) Sectoral Productivity Projections

Table 2 provides the quantified potential benefits of this framework. It details the estimated productivity impacts across Cameroon's primary sectors under the proposed AI model.

Table 2. Sectoral Productivity Impact Estimates: Cameroon AI Deployment Model

Sector	Baseline GDP Share	AI Efficiency Gain (Est.)	Primary Application	Net Economic Effect
Agriculture	~20%	8–12%	Precision farming, yield prediction	Export growth, food security
Public Administration	~15%	5–8%	Process automation, fraud detection	Cost savings, service quality
Energy	~10%	~10%	Grid optimization, demand forecasting	Reduced outages, revenue recovery
Trade & Logistics	~18%	10–15%	Route optimization, customs AI	Increased throughput, AfCFTA gains
Financial Services	~12%	12–18%	Credit scoring, AML detection	Financial inclusion, revenue growth

Note: Efficiency gain estimates are conservative projections derived from comparable AI deployments in Rwanda, Ghana, and Morocco (2019–2023). GDP share estimates based on World Bank Cameroon Economic Monitoring Report, Q2 2023.

3) Aggregate GDP Impact Projection

With coordinated reform and phased rollout, the model projects annual GDP productivity gains between 1.5% and 2.8% over a decade. Most of these gains appear in agriculture, logistics, and financial services. This projection aligns with IMF data for digital transformation in Sub Saharan Africa (IMF Working Paper WP/23/047, 2023) [12] and the AfDB’s growth models for the CEMAC region [13].

Sustained institutional reform is necessary because these gains are not guaranteed. This includes modernizing data rules, setting up an AI regulatory framework, and investing heavily in human capital. Without this governance alignment, AI will likely only produce small wins at the project level instead of a full economic transformation.

4.3. Governance Architecture: A Three-Layer Sovereign AI Framework

The governance framework proposed in this section operationalizes the paper’s central thesis. It argues that the introduction of AI in Cameroon requires a layered institutional architecture that precedes or runs concurrently with technology deployment. This framework draws on comparative analysis of Rwanda’s AI governance structure, the UAE’s National AI Strategy, and the European Union AI Act (2024) as normative reference points. These are adapted for Cameroon’s specific political economy and administrative tradition [14].

The three-layer architecture is designed according to four governing principles. These are subsidiarity, where decisions are made at the lowest appropriate institutional level; interoperability, so layers share data and authority through defined protocols; accountability, ensuring each layer has defined performance metrics; and adaptability, so the framework can accommodate technological change without requiring foundational restructuring [15] [16].



Figure 1. Three-Layer Sovereign AI Governance Model for Cameroon

1) Layer 1: Strategic Oversight

The apex governance layer comprises the National AI Council (NAIC), the AI Ethics and Risk Board, and the Parliamentary Technology Committee. Together, these bodies constitute the strategic intelligence function of the national AI system [17].

- **National AI Council (NAIC):** The NAIC should be established as a high level inter ministerial body chaired by the Presidency and co chaired by the Ministries of Posts and Telecommunications (MINPOSTEL) and the Economy, Planning and Regional Development (MINEPAT). Its mandate encompasses approving the National AI Strategy and its periodic revisions, resolving inter ministerial conflicts in AI policy, directing AI investment priorities, and representing Cameroon in multilateral AI governance forums like the Global Partnership on AI (GPAI).
- **AI Ethics and Risk Board:** This should function as an independent advisory body with authority to review AI deployments in sensitive domains like justice, health, and surveillance. It can issue binding recommendations where algorithmic systems affect fundamental rights. Its membership should include legal scholars, civil society representatives, technical AI experts, and international ethics specialists, reflecting the multi stakeholder governance model established by UNESCO.
- **Parliamentary Technology Committee:** Parliamentary oversight provides the democratic legitimacy that technical governance bodies inherently lack. The committee should be mandated to conduct annual reviews of AI deployment across government ministries, hold public hearings on AI related legislation, and commission independent audits of AI systems deployed in public administration.

2) Layer 2: Regulatory and Standards Authority

This intermediate level of governance brings together the AI Regulatory Authority, the Data Protection Commission, and the National Cybersecurity Operations Center [18] [19].

- **AI Regulatory Authority (AIRA)**
The AIRA functions as an autonomous agency. It maintains operational independence from direct ministerial control. This structure mirrors the existing telecommunications regulator in Cameroon known as ART. Primary duties for this body involve licensing AI systems within regulated industries and setting up algorithmic audit protocols. It also manages a national registry for AI systems and enforces the upcoming National AI Act. The agency follows a risk-tiered regulatory strategy. This approach aligns with how the EU AI Act categorizes various AI applications based on their specific risk levels [20].
- **Data Protection Commission Modernization**
Law No. 2010/012 serves as the current data protection foundation but now needs a full update. Modern AI processing demands new rules for large scale data collection and automated choices. It must also cover real time biometric processing and data moving across borders. This new framework takes cues from the GDPR and the 2022 AU Data Policy Framework. Safeguarding the rights of individuals regarding automated decisions remains a top priority for this modernization [21].

3) Layer 3: Operational Deployment

The operational layer connects sector ministries with private actors and research centers. These groups build and test AI tools within the rules set by the higher governance levels. Individual ministries take the lead on creating AI roadmaps for their specific fields. They handle the procurement of AI systems and ensure every tool meets national standards. All performance data goes back to the AI Regulatory Authority for review [22].

Innovation thrives when startups and foreign investors work inside a clear legal space. These private entities gain from state investments in high-speed connectivity and human capital. Universities provide the backbone for long term growth. They train the talent and conduct the independent audits that a mature national system needs to survive [23].

4.4. Infrastructure Imperative: Building the Digital Backbone

Digital infrastructure capable of supporting AI workloads is essential. AI governance frameworks cannot function without it, no matter how well-designed they are. This section addresses the four critical infrastructure components for national AI deployment. It presents investment requirement estimates calibrated to the geographic and demographic context of Cameroon [24].

1) Infrastructure Requirements Analysis

AI systems at a national scale require several specific foundations. Tier III or IV data centers must provide 99.982%+ uptime guarantees. A national fiber optic backbone needs to connect all ten regions. Rural 4G and selective 5G coverage are necessary so that AI-enabled public services remain geographically accessible. Stable electrical infrastructure is also vital. AI data centers typically consume 20–40 MW per facility [25].

Significant gaps exist across all four dimensions in Cameroon's current infrastructure status. Fiber coverage remains concentrated in the Centre, Littoral, and West regions. Rural electrification is progressing under MINEE's programs but remains insufficient to support data center operations in secondary cities. These gaps do not invalidate AI adoption. Instead, they establish sequencing requirements. Infrastructure investment must precede AI deployment mandates, not follow them [26].

2) Data Infrastructure

Both training and inference operations for AI applications require substantial computational capacity. Cameroon currently lacks any Tier III-certified national data center. Such a facility provides at least N+1 redundancy in power and cooling systems and 99.982% uptime (Uptime Institute, 2012). Establishing at least one nationally sovereign Tier III data center is a prerequisite. This is especially true for AI applications in sensitive domains like healthcare records, financial transactions, and public administration [27].

Hybrid architectures represent a pragmatic compromise in the near term. These combine nationally sovereign data infrastructure for sensitive data with international cloud services for less sensitive applications. This approach balances sovereignty objectives and cost efficiency. Agreements with hyperscale cloud providers like AWS, Azure, or Google Cloud should be negotiated. These must include data residency commitments, local hiring requirements, and technology transfer obligations [28].

Table 3. Digital Infrastructure Investment Requirements (5-Year Horizon, USD)

Infrastructure Component	Estimated 5-Year Investment (USD)	Strategic Rationale
National AI Data Center (Tier III)	\$120–180 million	Sovereign AI compute capacity; data residency
National Fiber Backbone Expansion	\$200–300 million	Universal data transmission infrastructure
Rural 4G/5G Connectivity	\$150 million	Geographic equity in AI-enabled services
Cybersecurity Infrastructure (National SOC)	\$50–80 million	AI system integrity and national security
AI Innovation Hubs (4 regional centers)	\$30–50 million	Private sector and research ecosystem activation
Total Projected Investment	~\$550–760 million	Phased over 5-year NDS-30 cycle

Note: Investment estimates derived from comparable national AI infrastructure programs in Rwanda (2020–2023), Ghana (2019–2022), and Egypt (NAIS implementation 2022–2023), adjusted for Cameroon's geographic scale and population distribution.

3) Connectivity Infrastructure

Approximately 8% of the population is reached by Cameroon's national fiber backbone. Coverage is concentrated in the Littoral, Centre, and West regions. Extending fiber connectivity to secondary cities is a prerequisite for equitable diffusion. Establishing last-mile connections through 4G and emerging 5G infrastructure is also necessary across the national territory [29].

4) Energy Infrastructure

A reliable electricity supply is non-negotiable for digital infrastructure. Cameroon's power sector is endowed with substantial hydroelectric potential but continues to experience significant grid instability. Outages affect both industrial and residential users. AI applications require a stable power supply for both data center operations and industrial deployment. The AI strategy must be closely coordinated with the energy sector modernization agenda. This includes the deployment of smart grid technologies and the expansion of renewable energy [30].

5) Implementation Sequencing

The infrastructure investment program should be sequenced in three distinct phases. Phase 1 covers Years 1–2. It should prioritize the National AI Data Center and core fiber backbone to provide the technical foundation for all subsequent deployments. Phase 2 spans Years 3–4. This phase should expand rural connectivity and establish regional AI innovation hubs. Phase 3 starts from Year 5 onward. It should complete selective 5G coverage and scale the National Cybersecurity Operations Center to full operational capacity.

4.5. Ethical Safeguards and Digital Sovereignty

Ethical dimensions of AI adoption are constitutive of governance design rather than supplementary to it. The principal ethical risks confronting Cameroon's AI introduction program are analyzed in this section. It proposes a structured mitigation framework grounded in international normative standards and adapted to the sociopolitical context of Cameroon.

1) Normative Framework

Cameroon, as a UNESCO Member State, endorsed the UNESCO Recommendation on the Ethics of Artificial Intelligence (2021). This establishes four foundational principles: proportionality and do no harm; safety and security; fairness and non-discrimination; and sustainability. These principles translate into concrete policy obligations that must be embedded in the AI regulatory architecture of Cameroon. The NIST AI Risk Management Framework (2023) complements the UNESCO framework by providing a practical risk management lifecycle of Govern, Map, Measure, and Manage. This lifecycle approach is particularly valuable for the context of Cameroon because it accommodates graduated implementation. Institutions can begin with basic risk mapping even before full regulatory infrastructure is in place.

2) Principal Ethical Risks

Several critical ethical risks must be addressed during the rollout:

- **Algorithmic Bias and Representational Harm**
AI systems will systematically produce biased outputs when deployed in public administration if they are trained on datasets that underrepresent Cameroonian populations. Rural communities, women, and indigenous language speakers are especially vulnerable. This is not a theoretical concern. Documented cases from healthcare AI in Kenya and credit scoring AI in South Africa demonstrate that algorithmic bias compounds existing structural inequalities when datasets lack demographic representativeness. Cameroon must invest in developing local datasets as a prerequisite for AI deployment in high stakes domains.
- **Surveillance Misuse**
Significant risks of state misuse exist for AI enabled surveillance technologies, including facial recognition and behavioral prediction systems. These risks are prominent in contexts with limited judicial oversight of executive action. The governance framework must establish clear legal restrictions on AI surveillance applications. Mandatory judicial authorization for AI assisted monitoring of individuals and a prohibition of pre-emptive surveillance systems are required.
- **Digital Dependency and Algorithmic Sovereignty**
The risk of foreign AI dependency threatens both the data sovereignty of Cameroon and its long term economic interests. This dependency is operationalized through exclusive reliance on externally developed foundation models and cloud infrastructure. Mitigations include mandatory technology transfer provisions in AI procurement contracts. Requirements for local data residency in government AI applications and investments in Cameroonian AI research capacity are also necessary to progressively reduce reliance on imported models.

3) Mitigation Framework

A comprehensive AI ethics mitigation framework for Cameroon should include mandatory algorithmic impact assessments for all public sector AI deployments. Public sector procurement requirements must specify performance equity across linguistic and demographic groups. A regulatory prohibition on facial recognition in public spaces without judicial authorization is essential. Mandatory data localization for sensitive categories of personal data and a national AI audit program modeled on the approach developed by the UK Centre for Data Ethics and Innovation should also be included.

4) Sovereignty Protection Instruments

To protect national sovereignty, the following instruments are essential:

- **National AI Audit Framework:** Independent auditors accredited by AIRA conduct mandatory algorithmic impact assessments for all government AI deployments.
- **Local Dataset Development Program:** A government funded initiative creates representative training datasets in French, English, and major Cameroonian languages.
- **Cross border Data Protection Agreements:** Bilateral treaties establish data sovereignty protections within the CEMAC and AfCFTA frameworks.
- **AI Procurement Standards:** Government procurement regulations require minimum technology transfer and local capacity building provisions from foreign AI vendors.

- Digital Public Infrastructure (DPI) Approach: Proprietary dependency is reduced through the adoption of open source AI components for non sensitive government applications.

4.6 Blended Finance Architecture for AI Investment Mobilization

Cameroon needs between \$550–760 million over five years for this program. This requirement far exceeds the country's capacity for unilateral public financing. Given the fiscal commitments under NDS-30 and post-pandemic debt issues, a blended finance architecture is a structural necessity. Blended finance uses concessional public or philanthropic funds to pull in additional commercial capital for development [31]. In the AI context, this architecture serves three functions: it mitigates risk for commercial investors, enhances credit terms for Cameroon, and provides grants for institutional capacity building.

1) Financing Stack Architecture

Table 4 shows the blended finance stack for Cameroon national AI investment program.

Table 4. Blended Finance Stack for Cameroon National AI Investment Program

Financing Tier	Instrument & Actors	Estimated Contribution
Tier 1: Concessional Multilateral	World Bank IDA / IFC, AfDB, EU-Africa Framework	\$200–280M (grants + loans)
Tier 2: Bilateral Sovereign Partners	France (AFD), Germany (KfW), Japan (JICA), China	\$100–150M (loans + tech help)
Tier 3: National Budget Allocation	Ministry of Finance, Special Investment Fund	\$80–120M over 5 years
Tier 4: Public-Private Partnerships	Orange, MTN, Microsoft, local ISPs	\$100–150M (infra + in-kind)
Tier 5: Innovation & Venture Capital	Partech Africa, AI Seed Fund, diaspora vehicles	\$50–80M (startup ecosystem)

2) Investment Mobilization Strategy

The strategy for mobilizing investment must build credibility with multilateral lenders before moving to commercial markets. Technical assistance grants from the World Bank and AfDB should be the focus of the first 12 months. These grants carry high political legitimacy and low conditionality. Once institutional progress is proven, the next 12 to 24 months can focus on negotiating concessional infrastructure loans for Phase 1.

A \$50 million AI Innovation Seed Fund acts as a catalyst. Structured as a blended instrument with multilateral co-funding, it signals commitment to the sector. This fund creates a market for local AI ventures and attracts diaspora investors by reducing their risk. Rwanda (\$12M AI Fund) and Kenya (\$25M Innovation Fund) have already shown that such funds can attract private investment at ratios of 3:1 to 5:1.

3) Bankability Conditions

Three preconditions must be met for this program to achieve bankability. First, the National AI Strategy needs formal adoption and publication. This provides policy certainty for investors. Second, the AI Regulatory Authority must exist to act as a counterpart in negotiations. Third, Cameroon must modernize its data protection. International investors, especially from Europe, will likely demand GDPR-equivalent standards before committing funds.

4.7. Human Capital Strategy: Building Sovereign AI Talent

Hardware without human capital is just inert capital. The long-term success of Cameroon's AI goals depends on the depth of talent in the public service, private sector, and research labs.

1) Pillar 1: National AI Curriculum Integration

AI literacy belongs at three educational levels. Primary students (ages 10–12) should focus on computational thinking. Secondary schools need modules on data analysis and AI ethics across

science and social science streams. At the university level, Yaoundé I, Yaoundé II, Douala, and Buea should establish dedicated AI engineering programs aligned with ACM/IEEE standards. This scale of reform requires a National AI Teacher Training Program, similar to the STEM initiative in Rwanda, funded by the Ministry of Secondary Education.

2) Pillar 2: Public Sector Executive AI Literacy

Public servants cannot manage AI systems without the literacy to interpret outputs or identify failures. Senior civil servants at the Director level and above must undergo mandatory AI training. ENAM is the logical institutional host for this. A partnership with an international provider, like the Oxford Internet Institute's AI4Gov program, would add global credibility to ENAM's local position.

3) Pillar 3: University AI Research Funding

Research grade AI capacity is essential for Cameroon's long term AI sovereignty. This is distinct from applied training. Without domestic research capacity, Cameroon will remain a consumer of AI systems developed elsewhere. The country will have limited ability to adapt, audit, or innovate beyond imported frameworks. The National AI Research Fund (NAIRF) should provide competitive grants for AI research at Cameroonian universities. This fund can be seeded through the blended finance structure proposed in Section 8. Mandatory open publication requirements and incentives for industry collaboration must be included in this setup.

4) Pillar 4: Diaspora AI Engagement Network

Cameroon's diaspora includes a significant concentration of AI and technology professionals in France, the United States, Canada, and Germany. A structured Diaspora AI Engagement Network should be established to facilitate knowledge transfer, investment, and mentorship. This network can be modeled on the successful Ethiopian diaspora technology program and the Rwandan Diaspora Investor Program. Specific mechanisms should include remote advisory roles in government AI programs. Investment tax incentives for diaspora contributions to the AI Innovation Seed Fund and rotating residency programs bringing diaspora expertise to Cameroonian universities are also key components.

4.8. Policy Recommendations

The following policy recommendations are organized by implementation horizon and institutional lead. They are designed to be sequenced to build institutional credibility before scaling investment and deployment.

1) Immediate Actions (0–12 months)

- Establish the National AI Council (NAIC): The NAIC should be established by Presidential Decree within 12 months. It needs a clear inter-ministerial mandate and a secretariat housed within MINPOSTEL. Its first deliverable should be the National AI Strategy White Paper.
- Publish the National AI Strategy White Paper: This comprehensive, publicly available strategy document should cover AI vision, sectoral priorities, and governance architecture. It must also include investment targets and ethical principles to serve as the foundational signal to multilateral lenders and international investors.
- Initiate Data Protection Act Modernization: Launch a structured legislative reform process for Law No. 2010/012. This requires a dedicated drafting committee and a public consultation process. Target enactment within 24 months [25].
- Engage the World Bank and AfDB for Technical Assistance Grants: Submit formal expressions of interest to the World Bank Digital Economy for Africa (DE4A) program and the AfDB Digital and Technology for Africa Initiative. This is for technical assistance funding to build governance capacity.

2) Medium-Term Actions (12–36 months)

- Establish the AI Regulatory Authority (AIRA): Enact the AI Regulatory Act. Operationalize AIRA with a multi-stakeholder board, adequate technical staffing, and international regulatory peer partnerships.

- Launch the \$50 Million AI Innovation Seed Fund: Capitalize the Fund with government seed investment and multilateral co-financing. Ensure a governance structure that guarantees competitive, merit-based allocation.
- Commission Phase 1 Infrastructure Investment: Initiate procurement for the National AI Data Center and fiber backbone expansion. This should leverage the blended finance structure outlined in Section 8.
- Establish ENAM AI Executive Training Program: Develop and launch mandatory AI literacy training for senior civil servants. This should be in partnership with an internationally recognized AI governance education provider.

3) Long-Term Actions (36–60 months)

- Secure Full Multilateral Co-Financing Commitments: Leverage demonstrated governance progress and Phase 1 infrastructure delivery. This allows for the negotiation of concessional financing for Phase 2 infrastructure expansion.
- Establish National AI Research Fund (NAIRF): Formalize a competitive research grant program for Cameroonian universities. It must include open publication and industry collaboration requirements.
- Launch Regional AI Leadership Initiative: Position Cameroon as a CEMAC regional hub for AI governance. Host the CEMAC AI Regulatory Forum and establish bilateral AI governance partnerships with at least three African states [30].

4.9. Risk Analysis and Mitigation Framework

Systematic risk identification and mitigation planning are essential components of any credible national AI strategy. These serve both governance integrity and investor confidence functions. This section presents a comprehensive risk matrix across five risk categories, including likelihood and impact assessments and mitigation strategies.

Table 5. Comprehensive AI Introduction Risk Matrix: Cameroon

Risk Factor	Likelihood	Impact	Mitigation Strategy
Digital Inequality	High	High	Expand rural connectivity and subsidize device access
Institutional Literacy Gap	High	High	Mandatory training at ENAM and ministerial advisors
Cybersecurity Breach	Medium	High	Establish a National SOC and mandate penetration testing
Regulatory Capture	Medium	High	Multi-stakeholder AIRA board and civil society inclusion
Algorithmic Bias	High	High	Local dataset development and mandatory bias audits
Political Instability	Medium	High	Independent AIRA and legislative anchoring of framework
Foreign AI Dependency	High	Medium	Tech transfer requirements and data residency mandates
Investment Failure	Low-Medium	High	Bankability frameworks and multilateral engagement

Risk likelihood and impact assessments are derived from expert stakeholder consultation. They are benchmarked against AI readiness risk assessments conducted by the AfDB for CEMAC member states (2023). The risk matrix reveals that the most serious risks are digital inequality, algorithmic bias, and political misuse of surveillance; are all fundamentally governance risks. They are not technical risks. This reinforces the paper's central argument that governance-first design is not merely a procedural preference. It is a substantive risk management imperative [29].

5. Conclusion

Artificial Intelligence cannot enter Cameroon as just a series of isolated pilots or scattered ministry projects. This paper shows that sustainable and sovereign AI adoption depends on institutional conditions. It requires a solid governance architecture, a clear regulatory framework, and a digital backbone. Ethical safeguards and human capital must also develop alongside these systems in a coordinated way. The theory is clear: AI without institutional alignment leads to dependency, not development. Comparative benchmarking shows Cameroon's current position. The window to lead in regional AI governance is narrowing while countries like Rwanda, Kenya, and South Africa move forward with their own frameworks. Our economic modeling suggests that coordinated adoption could add 1.5% to 2.8% to annual GDP productivity. This return is more than enough to justify the necessary investment in governance.

The proposed three-layer governance model, backed by our finance and ethics frameworks, offers Cameroon a realistic roadmap. It is based on political economy realism, not just technological optimism. By using a risk matrix, the framework avoids being naively hopeful. Instead, it systematically anticipates and mitigates the structural risks that have hindered other digitization efforts on the continent.

The conclusion is precise: without governance, AI increases dependency; with governance, AI becomes sovereignty. Cameroon already has the institutional anchors, the demographic dividend, and the international partnerships. The only thing left is the institutional will to begin.

Author's Declaration

The authors hereby declare significant contributions to the research process, manuscript preparation, and publication stages.

References

- [1] R. Vinuesa *et al.*, "The role of artificial intelligence in achieving the Sustainable Development Goals," *Nat. Commun.*, vol. 11, no. 1, p. 233, Jan. 2020, doi: 10.1038/s41467-019-14108-y.
- [2] M. Mazzucato, "Challenges and opportunities for inclusive and sustainable innovation-led growth in Brazil: a mission-oriented approach to public-private relationships," UCL Institute for Innovation and Public Purpose, London, UK, Working Paper IIPP WP 2024-17, 2024.
- [3] J.-D. Lee, K. Lee, D. Meissner, S. Radosevic, and N. Vonortas, Eds., *The Challenges of Technology and Economic Catch-up in Emerging Economies*. Oxford, UK: Oxford University Press, 2021. doi: 10.1093/oso/9780192896049.001.0001
- [4] A. Korinek and J. E. Stiglitz, "Artificial Intelligence, Globalization, and Strategies for Economic Development," National Bureau of Economic Research, Cambridge, MA, USA, Working Paper 28453, Feb. 2021. [Online]. Available: <http://www.nber.org/papers/w28453>. [Accessed: Dec 19, 2025].
- [5] A. Goldfarb and C. Tucker, "Digital Economics," *Journal of Economic Literature*, vol. 57, no. 1, pp. 3–43, 2019, doi: 10.1257/jel.20171452.
- [6] M. Kwet, "Digital Colonialism: US Empire and the New Imperialism in the Global South," *Race & Class*, vol. 60, no. 4, pp. 3–26, Apr. 2019, doi: 10.1177/0306396818823172
- [7] N. Couldry and U. A. Mejias, *The Costs of Connection: How Data Is Colonizing Human Life and Appropriating It for Capitalism*. Stanford, CA, USA: Stanford University Press, 2019.
- [8] D. Acemoglu, "Harms of AI," National Bureau of Economic Research, Cambridge, MA, USA, NBER Working Paper 29247, Sep. 2021. [Online]. Available: <http://www.nber.org/papers/w29247>. [Accessed: Dec 19, 2025].
- [9] McKinsey & Company, "Generative AI is poised to unleash the next wave of productivity. We take a first look at where business value could accrue and the potential impacts on the workforce," in *The Economic Potential of Generative AI: The Next Productivity Frontier*, 2023. [Online]. Available: McKinsey & Company. [Accessed: 12 Feb. 2025].
- [10] National Institute of Standards and Technology, *Artificial Intelligence Risk Management Framework (AI RMF 1.0)*, NIST AI 100-1, Jan. 2023. [Online]. Available: NIST AI 100-1 PDF. [Accessed: 12 Feb. 2025].
- [11] World Bank, "Cameroon country economic memorandum: Pathways to growth and development," World Bank Group, Washington, DC, USA, May, 2022.

- [12] International Monetary Fund, “Digital transformation in Sub-Saharan Africa: Productivity impacts and governance conditions,” IMF, Washington, DC, USA, Working Paper WP/23/047, Mar., 2023.
- [13] African Development Bank, “Digital and technology for Africa: Infrastructure and AI growth model for CEMAC region,” AfDB, Abidjan, Côte d’Ivoire, 2022.
- [14] M. R. Albous, O. R. Al-Jayyousi, and M. Stephens, “AI Governance in the GCC States: A Comparative Analysis of National AI Strategies,” *Journal of Artificial Intelligence Research*, vol. 82, pp. 2389–2422, Apr. 2025, doi: 10.1613/jair.1.17619.
- [15] National Information Technology Agency, *Government of Ghana eGovernment Interoperability Framework (eGIF) Version 2.0*, Draft for Stakeholder Review. Accra, Ghana: National Information Technology Agency (NITA), 2022. [Online]. Available: NITA Ghana eGIF Version 2.0 PDF. [Accessed: Dec 19, 2025].
- [16] S. Brokensha, E. Kotzé, and B. A. Senekal, “(Mis)perceptions of AI in Africa,” in *AI in and for Africa*, Mar. 2023, pp. 45–56, doi: 10.1201/9781003276135-4.
- [17] E. E. Atem, “Strategic Introduction of Artificial Intelligence In Cameroon Public Administration: A Governance-Driven Framework for National Transformation, Ethical Safeguards, and Investment Mobilization,” Feb. 2026, doi: 10.13140/RG.2.2.16902.43849.
- [18] European Parliament, “Review of the Member States’ National AI Strategies,” *European Parliament*, Brussels, Belgium, Study PE 778.575, Jan., 2025.
- [19] D. O. Eke, K. Wakunuma, and S. Akintoye, “Introducing Responsible AI in Africa,” in *Responsible AI in Africa*, D. O. Eke, K. Wakunuma, and S. Akintoye, Eds. Cham, Switzerland: Palgrave Macmillan, 2023, doi: 10.1007/978-3-031-08215-3_1.
- [20] N. Melo, “The Impact of AI-Powered Tutoring Platforms on Student Achievement in STEM Subjects: The Case of Cameroon,” *SSRN Electronic Journal*, Oct. 4, 2024, doi: 10.2139/ssrn.5249691.
- [21] LEX Africa, “Data protection overview in Cameroon,” *LEX Africa*, 31-Mar-2020
- [22] O. Agbabiaka, A. Ojo, and N. Connolly, “Requirements for trustworthy AI-enabled automated decision-making in the public sector: A systematic review,” *Technological Forecasting and Social Change*, vol. 215, Jun. 2025.
- [23] F. Sovrano, F. Vitali, and M. Palmirani, “Modelling GDPR-Compliant Explanations for Trustworthy AI,” in *Electronic Government and the Information Systems Perspective*, 9th Int. Conf., EGOVIS 2020, Bratislava, Slovakia, Sep. 14–17, 2020, Proceedings, Lecture Notes in Computer Science, 2020, pp. 219–233, doi: 10.1007/978-3-030-58957-8_16.
- [24] O. Albulayhi and A. Alkhalifah, “AI Governance Risk Tiering for Sustainable Digital Infrastructure: A Systematic Review of Cybersecurity Frameworks,” *Sustainability*, vol. 18, no. 6, Art. no. 2986, 2026, doi: 10.3390/su18062986.
- [25] M. E. E. Alahi, A. Sukkuea, F. W. Tina, A. Nag, W. Kurdthongmee, K. Suwannarat, and S. C. Mukhopadhyay, “Integration of IoT-Enabled Technologies and Artificial Intelligence (AI) for Smart City Scenario: Recent Advancements and Future Trends,” *Sensors*, vol. 23, no. 11, Art. no. 5206, 2023, doi: 10.3390/s23115206.
- [26] J. G. Hoogeveen, *Republic of Cameroon: Priorities for Ending Poverty and Boosting Shared Prosperity - Systematic Country Diagnostic*. Washington, DC, USA: World Bank, Jun. 2016. [Online]. Available: World Bank Open Knowledge Repository. [Accessed: Dec 19, 2025].
- [27] Uptime Institute, “Data Center Tier Classification System,” *Uptime Institute*, 2012.
- [28] S. Galij, G. Pawlak, and S. Grzyb, “Modeling Data Sovereignty in Public Cloud—A Comparison of Existing Solutions,” *Applied Sciences*, vol. 14, no. 23, Art. no. 10803, 2024, doi: 10.3390/app142310803
- [29] J. Haar, R. Ernst, and S. Gutierrez, “Case Studies,” in *Winning in the New Global Business Landscape*. Cham, Switzerland: Palgrave Macmillan, 2025, doi: 10.1007/978-3-031-95970-7_6
- [30] Y. Ayuketah, S. Gyamfi, F. A. Diawuo, and A. S. Dagoumas, “Power generation expansion pathways: A policy analysis of the Cameroon power system,” *Energy Strategy Reviews*, vol. 44, Nov. 2022.
- [31] OECD, “Blended finance in the poorest countries: The need for a better development finance mix,” *OECD Development Co-operation Directions*, Organisation for Economic Co-operation and Development, Paris, France, 2022.