AI in African Local Governments: Ethical and Institutional Challenges in Cameroon

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Abstract: The growing integration of artificial intelligence (AI) into local public administration is transforming governance practices in Africa's decentralised local governments (CTDs). In Cameroon, this transformation is accompanied by institutional, ethical, and regulatory challenges of substantial scale, as municipalities face mounting pressure to digitise services while lacking the legal frameworks, technical skills, and oversight bodies needed to govern algorithmic systems responsibly. This article analyses the implications of algorithmic governance in African CTDs through a sequential mixed-methods design combining a systematic review of 87 publications (42 retained), secondary quantitative data from the OECD, the World Bank GovTech Maturity Index, the AI Now Institute, and the ITU, and an empirical survey of three Cameroonian CTDs comprising 34 semi-structured interviews, 12 institutional documents, and direct observation. The international comparison is further extended to two large emerging economies of the Global South, Brazil and India, whose large-scale algorithmic social programmes (Bolsa Família and Aadhaar respectively) offer cautionary lessons directly transferable to the Cameroonian context. The results reveal a fundamental paradox: while the level of institutional ethical concern is high (78–85/100 depending on the dimension), institutional capacity to respond remains very low (18–35/100), resulting in an average Ethical Governance Gap (EGG) of 55.7 points. No formalized AI system was found to be operating in any of the three Cameroonian CTDs studied, suggesting the country occupies a pre-algorithmic stage that, paradoxically, offers a window of opportunity to build in ethical safeguards before large-scale deployment occurs, rather than retrofitting them under judicial and social pressure as Brazil and India have had to do. Building on this evidence, the article proposes an integrated framework for the ethical governance of AI structured in three layers' ethical foundations, governance mechanisms, and implementation instruments together with a five-level maturity grid, an ethical algorithmic process model, and five concrete legislative recommendations for Cameroon inspired by the Brazilian and Indian experiences.

Keywords: Algorithmic governance, Artificial intelligence, Digital ethics, Decentralised local governments, Digital sovereignty, Ethical governance gap

1. Introduction

The digital transformation of local public administrations is one of the major challenges of contemporary governance. Driven by the spread of cloud infrastructure, falling computing costs, and the growing digitisation of administrative data, AI is steadily establishing itself as a fully-fledged public management tool. Through predictive analytics, decision automation, and real-time optimisation of public resources, it represents a significant advance over traditional municipal information systems.

CTDs occupy a position both strategic and vulnerable. As the first point of contact between populations and public services, they are best placed to benefit from these innovations bringing administration closer to citizens and improving the quality of service delivery yet least equipped institutionally to manage the risks. This is concerning since algorithmic decisions made at the local level directly affect citizens' daily lives: social assistance, building permits, tax-fraud detection, or urban security interventions. An ethical failure here has immediate, concrete consequences for populations that are often already vulnerable.

According to OECD analyses, the integration of artificial intelligence is progressing rapidly within the public services of member countries, while developing territories, particularly in Africa, face a marked structural lag. This gap reflects deep inequalities in institutional capacity, regulation, and technological sovereignty, rooted in major asymmetries in financing, skilled digital expertise, and decentralised connectivity infrastructure. For algorithmic governance, the rules, processes, and institutions governing the design, deployment, and oversight of AI systems raise fundamental ethical issues such as transparency, accountability, fairness towards vulnerable groups, data protection, and digital sovereignty. These issues are especially acute in African CTDs, where regulatory frameworks are sparse, oversight authorities often non-existent, and democratic control mechanisms are fragile, leaving foreign technology providers to operate with little institutional counterweight.

To better situate these challenges, this article extends the international analysis to two major emerging economies of the Global South, Brazil and India, whose experiences with large-scale algorithmic governance through the Bolsa Família and Aadhaar programmes respectively offer lessons transferable to the Cameroonian context. Although both countries have more advanced legal frameworks than most African nations, they have faced major controversies linked to algorithmic bias affecting vulnerable populations. Cameroon, with no large-

scale social algorithmic system yet, has a rare opportunity to anticipate these pitfalls rather than correct them after the fact.

2. Explicit Scientific Contribution

This research contributes: (1) the "Ethical Governance Gap" (EGG) index; (2) a first empirical analysis of algorithmic governance capacity in Cameroonian CTDs; (3) a maturity grid for African local administrations; (4) a comparison with Brazil's and India's large-scale algorithmic governance experience.

2.1 Research Question

To what extent do the institutional capacities of Cameroonian CTDs constitute a limiting factor for the adoption of ethical algorithmic governance, and what can sub-Saharan African countries learn from the comparative trajectories of Brazil and India?

2.2 Study Objectives

- Analyse the state of algorithmic governance in African and Cameroonian CTDs, documenting adoption levels and institutional capacity gaps;
- Identify and prioritize the ethical risks associated with deploying AI systems in local public administration;
- Assess the structural gap between ethical concern and the actual response capacity of institutional actors;
- Compare Cameroon's algorithmic governance trajectory with those of Brazil and India, drawing on concrete examples of large-scale public programmes;
- Propose an integrated operational framework, accompanied by concrete legislative recommendations, adapted to the constraints of sub-Saharan African CTDs.

2.3 Research Hypotheses

H1: Territorial officials' ethical concerns are significantly higher than the institutional capacities available to govern AI systems.

H2: A CTD's level of digital maturity is positively associated with its algorithmic governance capacity.

H3 (new hypothesis): The ethical challenges of algorithmic governance differ significantly between sub-Saharan Africa and the emerging economies of the Global South (Brazil, India) that have already deployed large-scale algorithmic systems, owing to differences in regulatory maturity, deployment scale, and institutional structure.

2.4 Scientific Positioning

This article addresses an emerging field—algorithmic governance in African public administrations—that has been largely overlooked in the international literature. Conceptually, it operationalises the EGG as a composite measure of the gap between institutional concern and actual capacity. Empirically, it provides one of the first analyses of algorithmic-governance maturity in Cameroonian CTDs, set against two emblematic Global South trajectories. Practically, it provides a usable framework and precise legislative recommendations for local decision-makers.

3. Theoretical and Conceptual Framework

3.1 Algorithmic Governance: Definition and Scope

Algorithmic governance comprises the processes, rules, and institutions governing the design, deployment, oversight, and evaluation of algorithmic systems (Rouvroy 2013; Gillespie 2014). In local government it operates at three levels: strategic (predictive analytics, planning), administrative (high-impact automated decisions social aid, permits, fraud detection), and operational (smart urban services waste collection, adaptive lighting, and predictive maintenance).

3.2 The Ethical Issues of AI in Public Governance

The literature identifies five main categories of ethical issue, summarised in Table 1.

Table 1: Main ethical issues of algorithmic governance in CTDs. Source: author's synthesis based on OECD (2019), UNESCO (2021), AI Now Institute (2023)

Ethical issue	Operational definition	Main risk	Normative reference
Transparency	Comprehensibility of algorithmic decisions by citizens and officials	Opacity of the "black box"	OECD (2019); GDPR Art.22
Accountability	Clear identification of actors responsible for an automated decision	Diffusion of responsibility between humans and machines	UNESCO (2021)
Algorithmic fairness	Absence of systemic discrimination in AI system outputs	Bias in training data disadvantaging vulnerable groups	AI Now Institute (2023)
Data protection	Respect for privacy and minimisation of personal data collection	Excessive collection; unconsented transfers to third parties	ITU (2023); UNESCO (2021)
Digital sovereignty	National control over deployed infrastructure, data, and algorithms	External technological dependence — digital neo-colonialism	Ndemo and Weiss (2017)

3.3 The African Context: Risk Amplifiers

Three structural factors amplify these risks in Africa. AI training data are drawn mostly from North American and European contexts, biasing outcomes against African populations linguistically, socio-economically, and biometrically (Russell and Norvig 2021). Only 33 of 54 African countries have a data-protection law (ITU 2023), leaving a legal vacuum. And near-total dependence on foreign technology produces what Ndemo and Weiss (2017) call "digital neo-colonialism."

3.4 Digital Sovereignty and Digital Neo-colonialism: A Structural Link

Ndemo and Weiss's (2017) concept of digital neo-colonialism illuminates digital sovereignty in African CTDs directly. When cloud infrastructure, models, and standards are designed and controlled externally, sovereignty becomes largely nominal: CTDs lose the ability to understand, audit, and correct the systems they deploy reproducing, in updated form, historical relations of economic and technological domination. The link is direct: lacking digital sovereignty is the structural condition for digital neo-colonialism, and reclaiming it through national data hosting, local audit capacity, and diversified partnerships is necessary, though not sufficient, to break this dependence.

3.5 The Design-reality gap Applied to Algorithmic Governance: An Extension to the Ethical Dimension

Heeks (2002) shows digital projects fail when system design diverges too far from local institutional realities, identifying seven gap dimensions but no explicit ethical one. This article adds a distinct ethical gap: the distance between international normative standards (transparency, fairness, accountability) and African CTDs' actual capacity to operationalise them. This explains why a technically functional AI system can remain ethically deficient technical success does not imply ethical compliance, and the two gaps require coordinated but distinct intervention.

4. Methogology

4.1 Research Design

This study uses a sequential mixed-methods design (Creswell and Plano Clark 2011), combining secondary quantitative data with an empirical qualitative phase, allowing both quantification of governance deficits and understanding of their institutional mechanisms. The Cameroon–Brazil–India comparison relies exclusively on secondary sources (reports, literature, case law) a limitation discussed in Section 8.

4.2 Phase 1 — Systematic Literature Review

The review covered 87 publications and reports (2010–2024) from Google Scholar, JSTOR, SSRN, the OECD, the World Bank, and UNESCO; 42 were retained after applying inclusion criteria, supplemented by targeted research on Brazil (Bolsa Família, LGPD) and India (Aadhaar, NITI Aayog).

4.3 Phase 2 — Quantitative Secondary Data Analysis

- OECD /Digital Government Observatory (2023): AI adoption rates by sector in local administrations of member countries;
- World Bank /GovTech Maturity Index (2022): digital maturity index, survey of 24 African CTDs covering 18 countries;
- AI Now Institute (2023) / Algorithmic Justice League (2023): measurement of algorithmic bias in public systems;
- ITU (2023)/ mapping of African personal data protection legislation;
- Brazilian institutional reports (Office of the Comptroller General of the Union, Ministry of Social Development) and Indian reports (NITI Aayog, UIDAI) for the extended international comparison.

The six dimensions were selected to cover the principal ethical concerns identified in the literature review (§3.2): transparency, accountability, and fairness are each weighted at 20%, reflecting their status as the core due-process requirements most frequently emphasised in AI governance frameworks (OECD 2019; UNESCO 2021); data protection and citizen participation are weighted at 15% each as important but comparatively secondary safeguards; and digital sovereignty is weighted at 10%, since it functions as a context-specific amplifier of the other risks in Africa rather than a universal governance requirement. These weightings reflect the author's own judgement, informed by the relative emphasis given to each dimension across the 42 reviewed sources, rather than a formal expert-panel elicitation a limitation acknowledged in §4.5.

4.4 Phase 3 — Empirical Survey in Cameroon

Three Cameroonian CTDs were purposively sampled the selection of three CTDs was guided by two complementary rationales. First, working sessions conducted with Cameroon's supervisory ministries, the Ministry of Decentralization and Local Development and the Ministry of Posts and Telecommunications confirmed that the Cameroonian territorial landscape is structurally organized around three distinct types of CTD: metropolitan urban communities, district municipalities, and rural or peri-urban municipalities. The three sites retained the Urban Community of Yaoundé, Yaoundé 3 Municipality, and the Rural Municipality of Mbankomo each represent one of these institutional categories, thereby covering the full typological spectrum of Cameroonian decentralized governance. Second, this three-tier typology mirrors the sampling frameworks adopted in comparative studies of algorithmic governance in similar emerging-economy contexts, including fieldwork conducted in Brazil's municipal administrations (ranging from the metropolitan scale of São Paulo to mid-sized and rural *municípios*) and in India's local bodies (from urban local bodies to gram panchayats). (Table 2). Data collection combined 34 semi-structured interviews elected officials (n=10), technical staff (n=14), digital providers (n=10) analysis of 12 institutional documents, and direct observation.

Table 2: Empirical survey sites. Source: National Institute of Statistics of Cameroon (2022); author's estimates

Field site	Type of CTD	Population	Digital level	Profile
Urban Community of Yaoundé	Metropolitan urban CTD	~4 million inhab.	Intermediate	Metropolis
Yaoundé 3 Municipality	District municipality	~350,000 inhab.	Emerging	District
Rural Municipality of Mbankomo	Peri-urban/rural municipality	~80,000 inhab.	Low	Rural

4.5 Methodological Limitations

Four limitations apply: AI adoption's embryonic state limits primary-data depth; the three-CTD sample precludes statistical generalisation; some estimates extrapolate from secondary sources; and the Brazil/India comparison rests solely on secondary data without field research, limiting granularity and calling for caution in transferring its lessons.

5. Results

5.1 State of AI Adoption in African CTDs, Brazil, and India

Secondary data show a wide gap between OECD and African CTDs across all sectors studied (Table 3). Brazil and India occupy an intermediate position 41% average AI adoption each, above Africa's 9% but below the OECD's 47% reflecting heavy past investment, notably in administrative and social services. No formalised AI system was

found in the three Cameroonian CTDs, a pre-algorithmic stage that paradoxically favours building in demanding ethical standards from the outset, provided Cameroon learns from Brazil's and India's difficulties.

Table 3: AI adoption rates in local public services by sector — comparison of OECD, African CTDs, Brazil, and India (2023). Source: OECD (2023); GSMA (2023); author's estimates

Public service sector	OECD (2023)	African CTDs (2023)	Brazil (2023)	India (2023)
Public transport	62%	12%	41%	38%
Urban security	58%	8%	35%	44%
Administrative services	52%	11%	58%	62%
Taxation & collection	45%	7%	49%	55%
Waste management	41%	6%	22%	19%
Urban planning & land	38%	5%	27%	24%
Social services	35%	9%	51%	46%
Financial management	47%	10%	44%	41%
AVERAGE	47%	9%	41%	41%

5.2 The Ethical gap: Concern vs. Response Capacity

A deep paradox emerges: institutional actors' voice high concern but have very limited response capacity. **The EGG index (EGG = $\Sigma(P_i - C_i) \times w_i$; P = concern, C = capacity, w = dimension weight**) quantifies this gap across six dimensions (Tables 4–5). The concern (P) and capacity (C) scores were derived from the World Bank GovTech Maturity Index (2022) survey of 24 African CTDs: P is the proportion of surveyed officials rating an issue as a high or very high concern, and C is the proportion reporting that their institution has the corresponding tools, skills, or legal frameworks in place. This construction allows the EGG to capture the structural shortfall between ethical awareness and institutions' actual capacity to act on it, which is the gap most relevant to assessing algorithmic-governance readiness in African CTDs.

Table 4: Construction of the ethical gap index

Dimension	Weighting
Transparency	20%
Accountability	20%
Fairness	20%
Data protection	15%
Citizen participation	15%
Digital sovereignty	10%

Table 5: Ethical concern vs. response capacity of African CTDs (0–100 index). Source: World Bank GovTech Maturity Index (2022); survey of 24 African CTDs (2023)

Ethical issue	Concern (0–100)	Response capacity (0–100)	Ethical gap
Algorithmic transparency	85/100	18/100	▼ 67 pts
Data security	82/100	22/100	▼ 60 pts
Fairness & non-discrimination	78/100	25/100	▼ 53 pts
Institutional accountability	80/100	20/100	▼ 60 pts
Privacy protection	76/100	30/100	▼ 46 pts
Digital sovereignty	83/100	35/100	▼ 48 pts
OVERALL AVERAGE	80.7/100	25/100	▼ 55.7 pts

The gap is widest for algorithmic transparency (67 pts) and institutional accountability (60 pts). Interviews confirm officials precisely identify risks of opacity and bias but unanimously lack the tools, skills, and legal frameworks to address them.

5.3 Algorithmic Bias in African CTDs: Lessons from Bolsa Família and Aadhaar

AI Now Institute (2023) and Algorithmic Justice League (2023) data show algorithmic bias reaching 85% in predictive-security systems (Table 6). Linguistic bias is acute in Cameroon, where over 280 local languages risk producing erroneous NLP outputs for large segments of the population.

Table 6: Algorithmic bias: typologies, prevalence, and sectors at high ethical risk. Source: AI Now Institute (2023); Algorithmic Justice League (2023)

Bias typology	Description	Prevalence in AI systems
Representation bias	Under-representation of marginalized populations in training data	72%
Confirmation bias	Algorithms reproducing past discriminatory decisions	68%
Measurement bias	Proxy variables correlated with ethnic origin or socio-economic status	65%
Automation bias	Excessive reliance on algorithmic outputs without human verification	58%
Linguistic bias	NLP models not adapted to local African languages (pidgin, vernacular languages)	88%
Sector at high ethical risk		Risk level
Social assistance & transfers		Very high
Predictive security & policing		Very high
Access to municipal credit		High
Recruitment & human resources		High
Urban planning & land management		Moderate

Two examples illustrate these risks and offer transferable lessons. Brazil's Bolsa Família targeting algorithm has shown socio-economic classification bias excluding genuinely eligible rural households a risk analogous to Cameroon's future social-aid systems (Table 6, very-high-risk sector). India's Aadhaar biometric system (1.3bn+ people) has faced repeated legal challenges over representation bias: recognition errors disproportionately affect manual workers, the elderly, and rural populations, excluding them from rations and pensions. Both cases underscore the need for exclusion testing before any large-scale biometric deployment (Table 14, 7.5).

6. Maturity Levels of Algorithmic Governance

Applying the GovTech Maturity Index (World Bank 2022) to 12 African CTDs shows concentration at levels 1–2 (Table 7): Kigali reaches level 4 (72/100); Douala and Yaoundé sit at level 2 (35 and 30). Obstacles are more institutional than technological, the absent regulatory framework and skills deficit are the most critical blockers, while political will and international partnerships are the main levers (Table 8).

Table 7: Algorithmic governance maturity index in selected African CTDs (2023). Source: World Bank GovTech Maturity Index (2022); author's estimates

CTD/City	Lvl	Score/100	Maturity stage
Kigali (Rwanda)	4	72/100	Innovation
Accra (Ghana)	3	55/100	Institutionalization
Nairobi (Kenya)	3	52/100	Institutionalization
Lagos (Nigeria)	2	38/100	Experimentation
Douala (Cameroon)	2	35/100	Experimentation
Yaoundé (Cameroon)	2	30/100	Experimentation
Abidjan (Côte d'Ivoire)	2	32/100	Experimentation
Dakar (Senegal)	2	33/100	Experimentation
Bamako (Mali)	1	18/100	Initialization
Ndjamena (Chad)	1	12/100	Initialization

CTD/City	Lvl	Score/100	Maturity stage
Bangui (CAR)	1	10/100	Initialization
Brazzaville (Congo)	1	15/100	Initialization

Table 8: Institutional analysis of enabling and blocking factors. Source: field survey (2024); World Bank (2022); literature

Institutional factor	Nature	Influence	Source
Digital skills of officials	Blocking	High	Interviews
Digital infrastructure (energy, connectivity)	Blocking	Medium	Documents
AI and data regulatory framework	Blocking	Very high	Literature
Municipal budget dedicated to digital	Blocking	Medium	Interviews
Local political will	Enabling	High	Interviews
International cooperation (EU, AFD, GIZ)	Enabling	Medium	Literature
Dependence on foreign proprietary solutions	Blocking	Very high	Interviews

Comparison with Rwanda, Kenya, and Ghana (Table 9) shows Cameroon lagging in national AI strategy, data protection, and independent auditing.

Table 9: Comparison of algorithmic governance: Cameroon, Rwanda, Kenya, Ghana. Source: World Bank GovTech Maturity Index (2022); OECD (2023); Oxford Insights (2023)

Criterion	Cameroon	Rwanda	Kenya	Ghana
National AI strategy	Partial	Yes (Smart Rwanda)	Underway	Yes (Ghana Digital)
Data protection framework	Limited	Advanced	Intermediate	Intermediate
Local AI governance	Weak	Intermediate	Intermediate	Intermediate
Digital maturity of CTDs (/100)	30–35	72	52	55
Independent algorithmic audit	Absent	In place	Partial	Partial
Digital citizen participation	Embryonic	Developed	Developing	Developing

6.1 Extended Comparison: Cameroon, Brazil, India

Extending the comparison to Brazil and India (Table 10) confirms and nuances this finding. Both have formalised national AI strategies and legal data-protection frameworks Brazil's LGPD (2018), inspired by the GDPR, ranks among the Global South's most advanced yet their social algorithmic programmes (Bolsa Família, Aadhaar) show a legal framework alone does not prevent bias at scale. Cameroon, lacking any large-scale social algorithmic system, has a window of opportunity to design in safeguards from the start rather than retrofit them under pressure, as Brazil and India did.

Table 10: Extended comparison of algorithmic governance: Cameroon, Brazil, India. Source: LGPD (2018); NITI Aayog (2018); UIDAI; Brazilian Ministry of Social Development; academic literature

Criterion	Cameroon	Brazil	India
National AI strategy	Partial	Brazilian AI Strategy (EBIA, 2021)	National Strategy on AI (NITI Aayog, 2018)
Data protection framework	Limited	LGPD (Lei Geral de Proteção de Dados, 2018) — advanced	Digital Personal Data Protection Act (2023) — intermediate
Social algorithmic governance	Absent	Bolsa Família: algorithm-assisted social transfers, audited after bias scandals	Aadhaar: national biometric identification, contested for algorithmic exclusions
Independent algorithmic audit	Absent	Partial (Office of the Comptroller General of the Union)	Partial (UIDAI, subject to legal challenge)
Scale of population covered	—	~140 million (Bolsa Família/Auxílio Brazil)	~1.3 billion (Aadhaar)

7. Framework for the ethical governance of AI in African CTDs

7.1 Ethical Algorithmic Process Model

Table 11: Ethical algorithmic governance process model for CTDs. Source: developed by ZOA Jean (University of Yaoundé I), based on OECD (2019), UNESCO (2021)

Step	Functional content & ethical requirements	Ethical oversight
DATA	Collection of public data (civil registry, tax, urban, social). Standardization, cleaning, data governance → Municipal data warehouse	✓ Ethics committee
PROCESSING	Machine learning models, predictive analytics, classification. Prior bias audit — Mandatory ethical review before going into production	✓ Ethics committee
DECISION	Algorithmic recommendation subject to mandatory human validation. Full traceability — Public register of algorithmic decisions	✓ Ethics committee
SERVICES	Delivery of digital citizen service (e-service, notification, official document). Accessible channel: mobile, counter, web — multilingual	✓ Ethics committee
EVALUATION	Citizen evaluation of service quality (satisfaction, complaints). Feedback loop → continuous improvement of AI models	✓ Ethics committee
LEARNING LOOP	↺ Evaluations from steps 4 and 5 continuously feed into the AI models (step 2) and data collection policies (step 1), ensuring the progressive reduction of algorithmic bias.	✓ Independent audit

7.2 The six Fundamental Principles

Table 12: Six principles of ethical AI governance for African CTDs. Source: developed by the author, based on OECD (2019), UNESCO (2021)

Principle	Normative content	Priority operational measure
Transparency	Explainable algorithms, public documentation of systems, right to explanation	Annual public report on algorithms used by the CTD
Accountability	Clear chain of accountability, accessible and free recourse mechanisms for citizens	Appointment of an AI and Data Officer in each CTD
Fairness	Regular bias audits, impact testing on vulnerable populations prior to deployment	Prohibition of deployment without a prior algorithmic fairness audit
Data protection	Minimisation, informed consent, privacy by design, sovereign hosting	Public register of personal data algorithmic processing
Participation	Structured citizen consultation, multi-stakeholder ethics committees, right to challenge	Mandatory advisory vote before any high social-impact deployment
Sovereignty	Preference for local/regional solutions, national hosting of public data	Portability and auditability clause in all digital procurement contracts

7.3 Five-level Maturity Grid

Cameroon's three surveyed CTDs sit at level 1 (Mbankomo) and level 2 (Yaoundé 3, Urban Community of Yaoundé); the three-year target is level 3 for those at level 2.

Table 13: Algorithmic governance maturity grid for African CTDs (five levels). Source: developed by the author, based on the World Bank GovTech Maturity Index (2022)

#	Stage	AI usage	Regulatory framework	Priority actions
1	Initialization	No formalised AI system	Awareness-raising	IS diagnostic, basic training, needs mapping
2	Experimentation	Isolated pilot projects, partial digital tools	Digital charter, first data policies	Ethics committee, pilot audit, inter-CTD benchmarking
3	Structuring	AI in 1–2 sectors, partial integration	Internal AI regulation, designated DPO	AI officer, processing register, training plans
4	Institutionalization	Multi-sector AI, established data governance	Local data law, regular audits	Independent audits, citizen participation, AI observatory

#	Stage	AI usage	Regulatory framework	Priority actions
5	Innovation	AI at the core of governance, data-driven approach	Local GDPR compliance, digital sovereignty	Open algorithm data, GOVAI Toolkit, inter-CTD cooperation

7.4 Integrated Governance Framework — Visual Summary

Table 14: Integrated framework for the ethical governance of AI in African CTDs — three layers, six principles. Source: ZOA Jean (University of Yaoundé I), based on OECD (2019), UNESCO (2021), World Bank GovTech (2022)

Layer	Components
LAYER 3 — IMPLEMENTATION	CTD GOVAI Toolkit AI ethics charter Public register of algorithms Multi-stakeholder ethics committee Public official training Regular independent audits
LAYER 2 — MECHANISMS	Prior bias audit Mandatory human validation Processing register Citizen recourse mechanisms Open algorithmic data Local parliamentary oversight
LAYER 1 — ETHICAL FOUNDATIONS	Transparency Accountability Algorithmic fairness Data protection Citizen participation Digital sovereignty

7.5 Policy Implications: Legislative Recommendations for Cameroon

Drawing on Brazil's and India's experiences, five legislative recommendations are proposed for Cameroon (Table 15), aimed at building a robust framework before algorithmic systems spread, rather than waiting for scandals like those around Bolsa Família or Aadhaar.

Table 15: Legislative recommendations for Cameroon, inspired by the Brazilian and Indian experiences. Source: developed by the author

Axis	Recommendation for Cameroon	International inspiration
National strategy	Adopt a National Artificial Intelligence Strategy with sectoral objectives and an implementation timetable	Estratégia Brasileira de IA (EBIA, 2021); National Strategy on AI (NITI Aayog, India, 2018)
Data protection	Adopt a specific personal data protection law, aligned with international standards, with an independent supervisory authority	Brazilian LGPD (Lei Geral de Proteção de Dados, 2018)
Algorithmic audit	Create an independent national algorithmic audit body, empowered to examine AI systems deployed in the public sector before and after their commissioning	Office of the Comptroller General of the Union (Brazil); UIDAI (India, despite its limitations)
Social transparency	Require a mandatory prior audit of any algorithmic social assistance system, in light of the biases observed in the Bolsa Família programme	Bolsa Família (Brazil)
Inclusion and representation bias	Require exclusion and representativeness testing before deploying any biometric identification system, in light of the challenges raised by Aadhaar	Aadhaar (India)

The most structurally important recommendation is an independent algorithmic audit body modelled on, but stronger than, Brazil's CGU since it conditions the effectiveness of all other measures by verifying compliance with the Table 12 principles, before and after deployment.

8. Discussion

Algorithmic governance in African CTDs faces a dual challenge technical and institutional with the governance deficit (absent legal frameworks, audits, participation mechanisms) the most fundamental obstacle to ethical AI adoption. Investing in governance is economically rational: prior ethical audits cost far less than the social and legal costs of a biased system deployed at scale, as Aadhaar's prolonged litigation shows. This extends Heeks (2002) to the ethical dimension (§3.5).

The Brazil/India comparison partially validates H3: ethical challenges differ mainly by stage of emergence rather than by nature. Both deployed large-scale systems before audit frameworks matured, discovering bias after the fact; Cameroon sits upstream, with a unique opportunity to build in safeguards from the design stage the central lesson of the extended comparison.

Theoretically, the article extends algorithmic-governance analysis to African CTDs, proposes the EGG as an original indicator, calibrates a maturity grid to African constraints, links digital sovereignty to digital neo-colonialism, and extends Heeks's (2002) gap to ethics. Practically, the maturity grid, process model, and Table 15 recommendations offer Cameroonian authorities a directly usable reference.

Four limitations are acknowledged: the framework remains largely normative pending longitudinal validation across a broader, more linguistically diverse panel; generative AI's rapid evolution demands regular updates; local political dynamics shaping reform adoption are not yet integrated; and the Brazil/India comparison rests on secondary data alone, limiting transferability. Future work should include a five-year longitudinal study, extension to other Francophone African countries, and field research in Brazil and India.

9. Conclusion

Algorithmic governance in African public administrations is real, still embryonic, but accelerating. Cameroonian CTDs face from AI, but weak institutional capacity and a regulatory vacuum generate ethical and democratic risks that cannot be underestimated as Brazil's and India's experiences show even under more advanced legal frameworks. Building responsible algorithmic governance is both possible and necessary if AI is to become a vector of social inclusion and sustainable development rather than exclusion and technological dependence.

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Ethics Declaration: No formal ethical authorisation was required. The survey followed standard social-science research ethics: voluntary, informed participation; anonymisation of sensitive information; data used exclusively for scientific purposes; explicit consent obtained for all interviews. No personally identifiable data is disclosed.

AI Declaration: Generative AI tools were used in a limited, auxiliary capacity stylistic rephrasing, grammar checking, and bibliography formatting. All ideas, analyses, results, and conceptual contributions are entirely the author's own work, for which the author assumes full responsibility.

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