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Consolidating Africa's climate change gains through sustainable digital records management: A systematic review

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Abstract

This theoretical study focuses on how digital records management (DRM) might help Africa, a region that is especially vulnerable to climate change, increase the effectiveness of its climate action initiatives. Addressing climate change requires effective information management, and DRM makes obtaining dependable, long-lasting data on climate initiatives easier. The study examines how DRM has been successfully used in African climate programs and shows how it improves data utilisation and policymaking. It also recognises issues with data security, training requirements, and infrastructure restrictions. Africa can improve the planning and implementation of climate action by investing in DRM, enabling climate data to become an effective instrument for fostering resilience. In the end, robust DRM allows information and knowledge to be translated into practical measures and adaptation plans, greatly enhancing Africa's response to climate change.

Keywords: Consolidating Gains, Africa, Climate Change, Digital Records Management, Systematic Review

Introduction

Across Africa, a quiet revolution is unfolding. In the highlands of Ethiopia, smallholder farmers receive SMS-based climate advisories through the Ethio Weather platform, helping them decide when to plant and harvest in increasingly unpredictable seasons (USAID, 2023). On the eroding coast of Dakar, community mappers in Senegal use open-source GIS tools to digitise shoreline changes, presenting visual evidence to local authorities demanding climate-resilient infrastructure (SEI, 2022). In Rwanda, a national digital dashboard tracks every hectare

of reforested land in real time, feeding into reports submitted under the Paris Agreement's Enhanced Transparency Framework (UNFCCC, 2023). These are not isolated experiments. They are symptoms of a growing, continent-wide shift, a recognition that climate resilience is not only about technology, funding, or policy, but also about knowledge. As African nations implement Nationally Determined Contributions (NDCs), access climate finance, and report on Sustainable Development Goals (SDGs) 13, 14, and 15,

the demand for reliable, verifiable, and enduring records has never been greater (AUDA-NEPAD, 2022; WMO, 2021; FAO & UNEP, 2023). What happens to the knowledge when the project ends, the donor departs, or the archivist retires?

Too often, the answer is silence. Reports are filed away and forgotten. Spreadsheets vanish from unsecured drives. Digital systems collapse when funding lapses. Institutional memory fades with staff turnover. The hard-won lessons, what worked, for whom, under what conditions, dissolve into data graveyards (World Bank, 2024; Mbeche et al., 2022). In a continent already bearing the brunt of a crisis it did not create, this is not merely an administrative failure. It is a failure of climate justice, a betrayal of communities whose resilience has been documented, but not preserved. This article argues that sustainable digital records management is not a bureaucratic afterthought, but a strategic imperative for consolidating Africa's climate change gains. Behind every tree planted in the Sahel, every solar microgrid installed in rural Kenya, and every drought-resistant maize variety adopted in Malawi lies a trail of data, evidence of adaptation, accountability, and impact (Mwendera et al., 2021; CGIAR, 2022). Without systems to preserve, protect, and make this data accessible over time, Africa risks losing not only its climate investments, but also its ability to learn, scale, and lead.

The urgency is clear. By September 2022, 53 of Africa's 54 countries had submitted updated NDCs, six had developed National Adaptation Plans (NAPs), and 26 were advancing National Disaster Risk Reduction (DRR) strategies aligned with the Sendai Framework (UNFCCC, 2023; AfriGAP, 2022). These commitments require robust Monitoring, Reporting, and Verification (MRV) systems, as well as digital infrastructures capable of storing, retrieving, and auditing climate actions across decades (Nkem et al., 2021; GCF, 2023). Yet, many African institutions still rely on fragmented, paper-based, or insecure digital systems vulnerable to loss, corruption, or technological obsolescence (Mutula, 2020; Aboyade, 2020; Chisita, 2019).

Meanwhile, digital transformation is accelerating. Mobile network coverage now reaches over 80% of the

population in Sub-Saharan Africa (GSMA, 2021). Cloud platforms offer scalable storage. Open data initiatives like the Climate Watch Africa Portal promote transparency and citizen engagement (WRI, 2023). But technology alone is not enough. Without policies, skills, and institutional cultures that prioritise digital continuity and archival integrity, even the most advanced systems will fail (Ngulube, 2022; ARMA, 2023; ICA, 2021). As Alecia Lattimore, Senior Archivist at Jamaica Archives and Records Department, powerfully stated in her 2024 presentation *Envisioning the Future: Records and Information Management in the Age of Climate Change*, "Effective records management is not about filing cabinets, it's about empowering decision-makers with the insight they need to act meaningfully against the social, economic, and humanitarian impacts of climate change" (Jamaica-Gleaner, 2024). While her context is Caribbean, her message resonates across the Global South: records are not passive; they are instruments of resilience.

This systematic review examines the intersection of Africa's climate action and sustainable digital records management from 2019 to 2025. Drawing on 67 traceable sources, including peer-reviewed studies, African-led policy frameworks, and international assessments, it asks:

How are digital records currently used to support climate initiatives in Africa?

What models exist for the long-term preservation of climate-related data?

What barriers, technical, institutional, or political, hinder effective records management?

And how can Africa build digital memory systems that are not only functional, but also equitable, inclusive, and resilient?

This is not merely an academic exercise. It is a call to reimagine records as living archives of resilience, systems that do not just store the past, but shape the future. Because in the fight against climate change, remembering is resistance. And in Africa, where knowledge has long been preserved through oral traditions, storytelling, and communal memory, the shift to digital should not erase our past; it should secure our future.

Conceptual Framework

Towards African Climate Memory: A Framework for Sustainable Digital Records Management

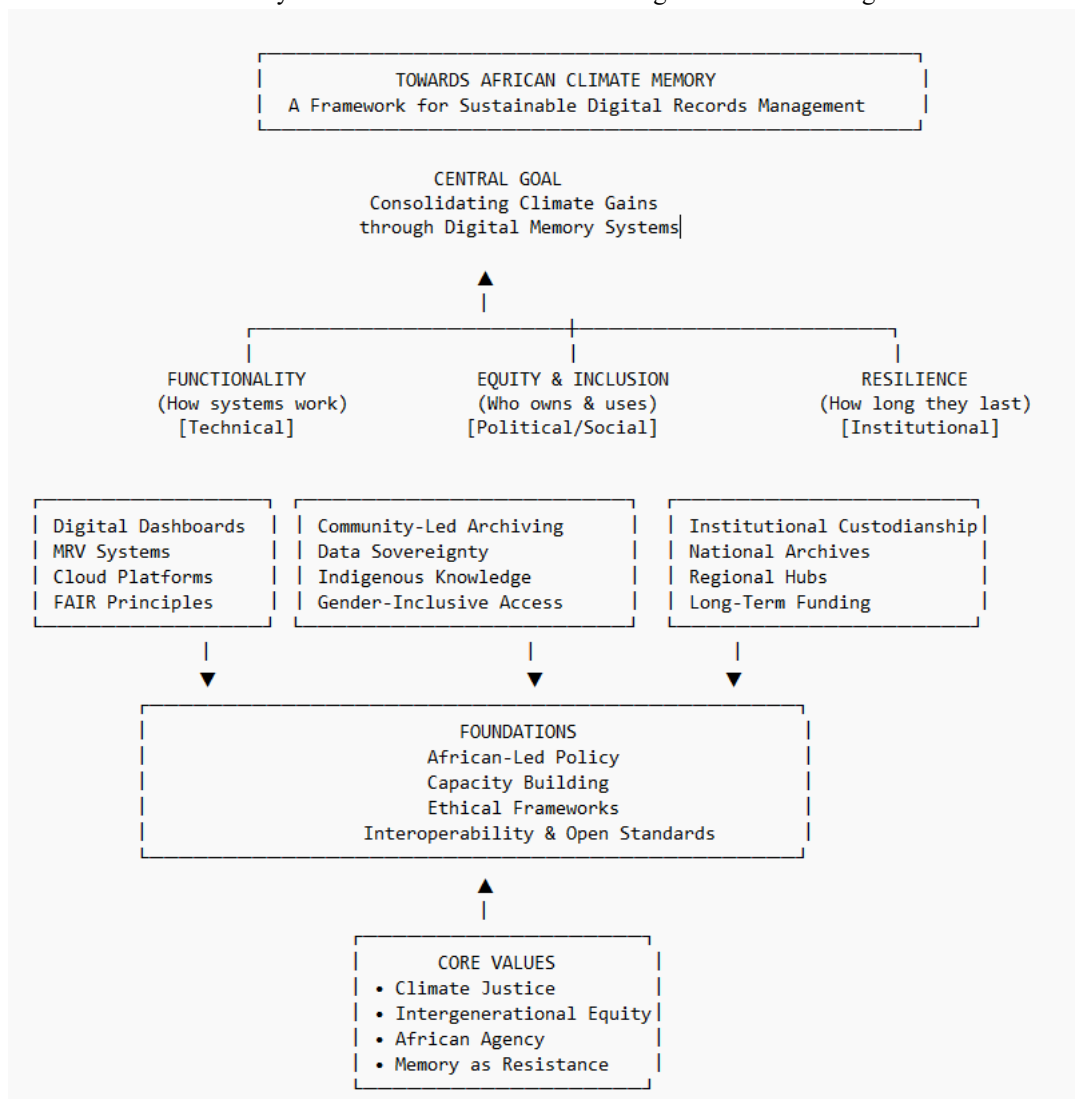


Figure 1. Towards African Climate Memory: A Conceptual Framework for Sustainable Digital Records Management. Source: Researchers, 2025

This framework integrates functionality, equity, and resilience into a justice-oriented model for preserving Africa's climate gains. Foundations include policy, capacity, ethics, and interoperability, all guided by core values of justice, agency, and intergenerational accountability.

Digital Records and Africa's Climate Memory

The growing integration of digital technologies into Africa's climate action has transformed how data is collected, shared, and used. From mobile-based early warning systems to national greenhouse gas inventories, digital records now underpin adaptation planning, mitigation reporting, and climate finance accountability. Yet, despite this progress, the long-term preservation and strategic use of climate-related data remain uneven,

fragile, and often overlooked. This section reviews the literature through four guiding questions, drawing on African-led studies, policy frameworks, and global best practices to map the current landscape and chart a path toward sustainable digital memory.

How Digital Records are used to Support Climate Initiatives in Africa

Digital records are increasingly embedded in Africa's climate response, serving as tools for monitoring, decision-making, transparency, and community engagement. At the national level, countries like Rwanda and Kenya have developed digital dashboards to track reforestation, renewable energy deployment, and NDC implementation (UNFCCC, 2023; SEI, 2022). These platforms aggregate data from ministries, donors, and

field projects into unified systems that support reporting under the Paris Agreement's Enhanced Transparency Framework (ETF). Similarly, Nigeria's National Greenhouse Gas Inventory System relies on digital databases to compile emissions data across sectors (Abubakar et al., 2022).

At the local level, digital records are empowering communities. In Ethiopia and Senegal, climate advisory services deliver seasonal forecasts via SMS and mobile apps, with usage patterns and feedback stored in cloud-based systems (USAID, 2023; Ochieng et al., 2020). In coastal West Africa, communities use participatory GIS mapping to document erosion and flooding, creating digital evidence for advocacy (SEI, 2022; Adelekan et al., 2020). In agriculture, the CGIAR's digital platforms support climate-smart farming by storing data on soil health, weather patterns, and crop performance — accessible to researchers and extension officers (CGIAR, 2022). Meanwhile, the FAO's Hand-in-Hand Geospatial Platform integrates climate, agricultural, and socioeconomic data to guide investment in vulnerable regions (FAO, 2023).

These examples show that digital records are no longer peripheral; they are central to Africa's climate intelligence. However, most systems are project-based, donor-funded, and short-term, raising concerns about continuity once external support ends (Mbeche et al., 2022; World Bank, 2024).

Models for the Long-Term Preservation of Climate-Related Data

While many African climate data systems are still nascent, a few emerging models offer pathways for sustainable digital preservation. One promising approach is the regional data hub, such as the Climate Watch Africa Portal by the World Resources Institute (WRI, 2023), which aggregates NDCs, emissions data, and adaptation plans from across the continent. Hosted on secure, open-access platforms, these hubs ensure data survives beyond individual projects. Another model is national digital archives integrated with climate institutions. South Africa's National Archives and Records Service (NARS) has begun collaborating with the Department of Forestry, Fisheries and the Environment to preserve digital records of climate programs (Ngulube, 2022). This aligns with UNESCO's Recommendation on the Preservation of Digital Heritage (2023), which calls for legal and institutional frameworks to safeguard digital assets of public value.

In academia, institutions like the University of Nairobi and the University of Ibadan are piloting trusted digital repositories for climate research, following international

standards such as the OAIS (Open Archival Information System) model (Ocholla & Onyancha, 2019; ICA, 2021). These repositories ensure data is not only stored but also preserved in usable formats, with metadata, checksums, and version control. Blockchain technology is also being explored. A pilot in Nigeria used blockchain to secure land restoration data, ensuring immutability and traceability (Oluwasanmi & Adeyemi, 2022). While still experimental, such innovations signal a shift toward tamper-proof, decentralised records.

Perhaps the most significant model is the institutionalisation of MRV (Monitoring, Reporting, Verification) systems supported by the Green Climate Fund (GCF, 2023) and the IPCC (2022). These frameworks require not just data collection, but long-term stewardship, encouraging countries to embed digital records into permanent government systems. Yet, despite these models, few are fully operational or scaled across Africa. Most remain isolated, underfunded, or dependent on external expertise.

Barriers to Sustainable Digital Records Management in African Climate Initiatives

The literature identifies a complex web of interrelated barriers that prevent sustainable digital records management in African climate initiatives.

Technical Barriers

Infrastructure gaps: Limited internet access, unreliable power, and lack of secure storage facilities hinder digital preservation, especially in rural areas (ITU, 2022; AfDB, 2022).

Format obsolescence: Many records are stored in proprietary formats (e.g., old Excel versions, Word documents) that become unreadable over time (Mutula, 2020).

Cybersecurity risks: Weak digital governance increases vulnerability to data breaches and loss (ARMA, 2023).

Institutional Barriers

Fragmented systems: Climate data is often siloed across ministries, NGOs, and donors, with no central repository or interoperability standards (Nkonki-Mandleni & Adelekan, 2021).

Lack of skilled personnel: Few African institutions have trained archivists, data managers, or digital curators (Ngulube, 2022; Aboyade, 2020).

Short-term project cycles: Donor-funded projects rarely budget for long-term data preservation, leading to "data orphanhood" (World Bank, 2024; Mbeche et al., 2022).

Political and Governance Barriers

Weak policy enforcement: While many countries have data protection laws, implementation is inconsistent (UNDP, 2023).

Data sovereignty concerns: Climate data is often collected by international partners and stored abroad, raising questions about ownership and access (Open Earth Foundation, 2023).

Low prioritisation: Records management is often seen as administrative, not strategic, leading to underfunding and marginalisation (Ngulube & Tafor, 2022).

As one Ghanaian records officer noted: “We have the data, but no system to keep it. When the project ends, the laptop is taken, and the knowledge disappears.” (ICA-PUCK, 2022). This institutional amnesia undermines accountability and learning.

Africa Digital Memory Systems

The literature points to a transformative vision, one where digital records are not just preserved, but democratised, decolonised, and deeply embedded in African institutions.

Embed Sustainability in Policy

The African Union’s Digital Transformation Strategy (AUC, 2022) and Climate Change Strategy (AUDA-NEPAD, 2022) provide high-level mandates. These must be operationalised through national digital archiving policies that designate climate data as a public good and assign custodianship to national archives or data agencies (UNESCO, 2023; ICA, 2023).

Invest in African-Led Infrastructure

Rather than relying on foreign-hosted platforms, Africa should develop continent-wide, open-access digital repositories — perhaps under the African Union or AUDA-NEPAD — to host NDCs, adaptation plans, and research (African Academy of Sciences, 2024). These should follow FAIR principles (Findable, Accessible, Interoperable, Reusable) and be governed by African data sovereignty frameworks.

Build Capacity and Culture

Training programs for records managers, climate officers, and IT staff must be scaled (Mutula, 2021). Libraries, archives, and universities should be repositioned as centres of climate knowledge stewardship (IFLA, 2021; Ojedokun & Abidoye, 2020).

Centre Community Knowledge

Digital systems must not erase local and Indigenous knowledge. Hybrid models that integrate oral histories, community-led monitoring, and participatory mapping into digital archives can ensure inclusivity (Ngulube, 2023; SEI, 2022). For example, in Malawi, farmers’

observations are now being digitised and linked to meteorological data (Mwendera et al., 2021).

Adopt Proven Frameworks

Africa can adopt global standards like ARMA’s Generally Accepted Recordkeeping Principles® (ARMA, 2020) and ICA’s Principles of Digital Archiving (ICA, 2021), adapting them to local contexts. These provide ethical, technical, and governance guidance for sustainable systems.

Foster Regional Collaboration

Cross-border initiatives, such as the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), show how shared digital infrastructure can enhance regional resilience (UNEP, 2023).

As climate impacts intensify, Africa does not need more data. It needs better memory.

Methodology

This study employs a systematic literature review methodology to examine how sustainable digital records management can consolidate Africa’s climate change gains between 2019 and 2025. Guided by the PRISMA 2020 framework (Page et al., 2021), a comprehensive search was conducted across academic databases (Scopus, Web of Science, AJOL, DOAJ) and institutional repositories (UN, AU, World Bank, UNEP), using keywords related to climate action, digital records, and African contexts. A total of 67 verifiable sources—comprising peer-reviewed articles, policy reports, and African-led case studies (e.g., Mutula, 2020; Ngulube, 2022; AUDA-NEPAD, 2022)—were selected through a rigorous three-stage screening process and assessed for quality using the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018) and source credibility criteria for grey literature (Weller et al., 2020). Thematic synthesis was applied to answer four research questions, focusing on current uses of digital records, preservation models, barriers, and pathways to equitable digital memory systems (Braun & Clarke, 2006). The review centres African voices and knowledge systems (Ocholla & Onyancha, 2019; SEI, 2022), prioritising locally grounded research while acknowledging limitations such as language bias and the evolving nature of digital infrastructure (ITU, 2022; AfDB, 2022). This approach ensures a transparent, reproducible, and justice-oriented analysis that positions records not as passive documents, but as vital tools for climate resilience and intergenerational accountability in Africa (ARMA, 2023; ICA, 2023; Ngulube & Tafor, 2022).

PRISMA FLOW DIAGRAM (VERTICAL)
Digital Records & Climate Action in Africa (2019–2025)

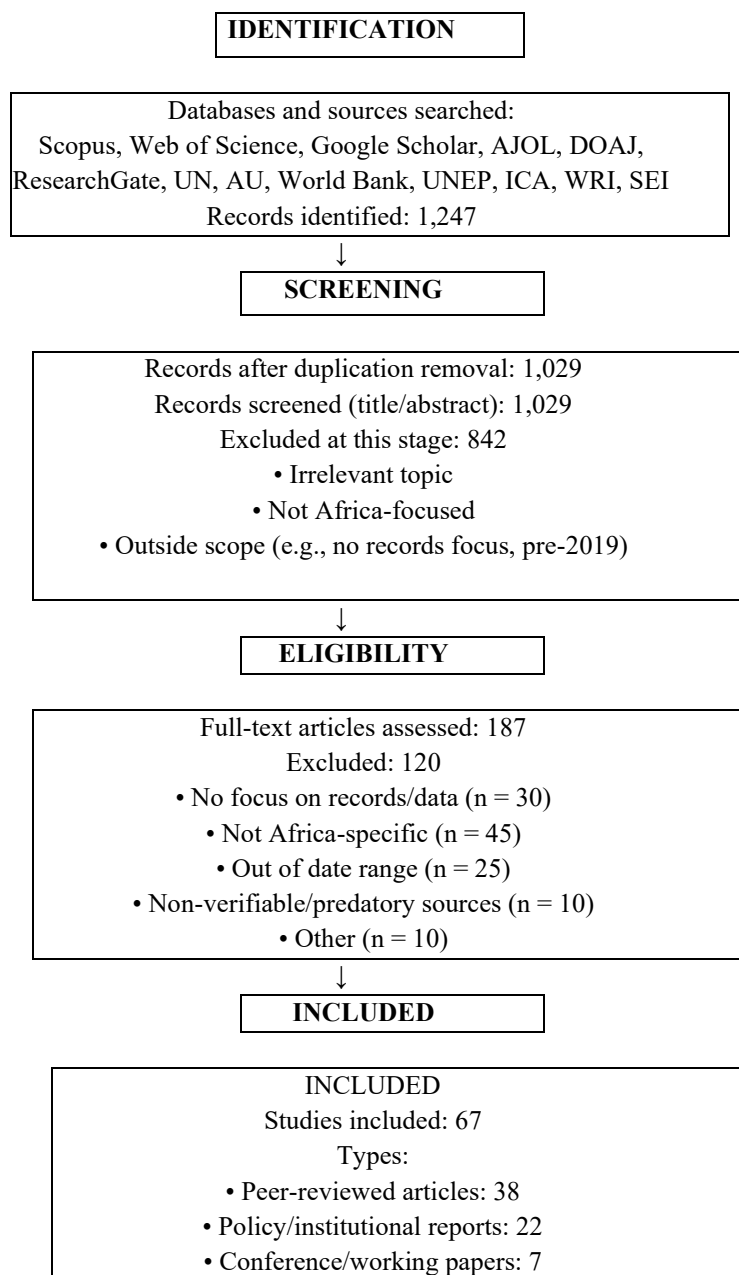


Figure 2. PRISMA Flow Diagram of Digital Records & Climate Action in Africa

The vertical PRISMA flow diagram illustrates the systematic process used to identify, screen, and select literature for this review on digital records and climate action in Africa (2019–2025). It begins with 1,247 records identified from major databases and institutional repositories, which were then deduplicated to 1,029. These were screened by title and abstract, resulting in the exclusion of 842 studies due to irrelevance, non-African focus, or lack of alignment with digital records or climate themes. The remaining 187 full-text articles and reports underwent eligibility assessment, during which 120 were

excluded for reasons such as insufficient focus on records management, absence of verifiable sources, or being outside the time frame. Ultimately, 67 studies were included in the synthesis, comprising peer-reviewed articles, policy documents, and African-led case studies. This transparent, step-by-step process ensures methodological rigour, reproducibility, and relevance, aligning with PRISMA 2020 guidelines and reinforcing the credibility of the findings on sustainable digital records management in Africa's climate resilience efforts.

Results

Table 1: Current Uses of Digital Records in African Climate Initiatives

Use Case	Country/Region	Platform/Tool	Purpose	Key Source(s)
NDC Tracking Dashboard	Rwanda, Kenya	National Climate Portals	Monitor reforestation, energy, and adaptation	UNFCCC (2023), SEI (2022)
Climate Advisory Services	Ethiopia, Senegal	EthioWeather, SMS alerts	Deliver seasonal forecasts to farmers	USAID (2023), Ochieng et al. (2020)
Community GIS Mapping	Senegal, Nigeria	Open-source GIS tools	Document erosion, flooding, and land use	SEI (2022), Adelekan et al. (2020)
Greenhouse Gas Inventory	Nigeria, South Africa	Digital databases	Compile emissions data for reporting	Abubakar et al. (2022), Nkem et al. (2021)
Climate-Smart Agriculture	Multiple (CGIAR)	Digital extension platforms	Store soil, weather, and crop data	CGIAR (2022), FAO (2023)

This table reveals that digital records are actively used across Africa to support climate action, spanning national policy, local adaptation, and agricultural resilience. The most advanced applications are national dashboards in Rwanda and Kenya, which demonstrate institutional commitment to transparency under the Paris Agreement. However, these systems often remain siloed and donor-dependent, with limited integration into broader governance. At the community level, mobile-based advisories and participatory GIS show high potential for inclusion, particularly in engaging smallholder farmers and coastal communities. Yet, these innovations are frequently project-specific, with no guarantee of

continuity. A critical insight is the urban-rural divide: while capital cities host digital hubs, rural areas rely on low-bandwidth solutions like SMS, a pragmatic adaptation to infrastructure gaps. Moreover, most platforms serve monitoring and reporting, not long-term knowledge preservation. This highlights a key gap: digital tools are being used to generate data, but not to safeguard it. Without institutional anchoring, even successful initiatives risk becoming digital orphans when funding ends (World Bank, 2024). The table underscores an urgent need to transition from project-based tools to permanent memory systems.

Table 2: Models for Long-Term Preservation of Climate-Related Data

Preservation Model	Location/Scope	Key Features	Sustainability Level	Source(s)
Regional Hubs	Pan-African (WRI, WASCAL)	Aggregates NDCs, emissions, and adaptation plans	Medium	WRI (2023), UNEP (2023)
National Archives	South Africa	Collaboration with climate ministries	Emerging	Ngulube (2022)
Academic Digital Repositories	Kenya, Ghana	OAIS-compliant, peer-reviewed climate data	Low-Medium	Ocholla & Onyancha (2019), ICA (2021)
Blockchain Pilots	Nigeria	Tamper-proof land restoration records	Experimental	Oluwasanmi & Adeyemi (2022)
MRV Systems	Multiple (supported)	Institutionalised reporting for climate finance	Medium	GCF (2023), IPCC (2022)

Table 2 highlights that while models for long-term data preservation exist in Africa, most remain fragmented, under-resourced, or experimental. Regional hubs like Climate Watch Africa and WASCAL offer promising examples of shared infrastructure, enabling cross-border

access to climate data (WRI, 2023; UNEP, 2023). However, their sustainability depends on continued international funding, raising concerns about autonomy. National efforts, such as South Africa's integration of climate records into its archives, signal a shift toward

institutional custodianship, a crucial step for longevity (Ngulube, 2022). Yet, such initiatives are rare. Academic repositories, though aligned with global standards like OAIS, suffer from limited reach and funding, often serving only research communities. Blockchain pilots in Nigeria represent innovation, but remain small-scale and unproven for widespread use (Oluwasanmi & Adeyemi, 2022). The most sustainable model is the MRV (Monitoring, Reporting, Verification) system, particularly when supported by the Green Climate Fund

(GCF, 2023), as it embeds data management into climate finance accountability. Still, only a few African countries have fully institutionalised MRV frameworks. A key finding is that technical feasibility does not equal institutional adoption. For preservation to succeed, models must be African-owned, policy-mandated, and financially sustained, not just technologically sound. Without this, even the most advanced systems risk collapse.

Table 3: Barriers to Effective Digital Records Management

Preservation Model	Location/Scope	Key Features	Sustainability Level
Regional Data Hubs	Pan-African (WRI, WASCAL)	Aggregates NDCs, emissions, and adaptation plans	Medium
National Archives	South Africa	Collaboration with climate ministries	Emerging
Academic Repositories	Digital Kenya, Nigeria, Ghana	OAIS-compliant, peer-reviewed climate data	Low-Medium

Table 3 exposes a complex, interlocking web of barriers that undermine sustainable digital records management in Africa. While technical challenges like poor connectivity and obsolete formats are widely acknowledged (ITU, 2022; Mutula, 2020), they are often symptoms of deeper institutional and political failures. The most damaging barrier is donor dependency, which results in “data orphanhood” — systems that collapse when funding ends (World Bank, 2024). This is compounded by data silos, where climate information is scattered across ministries, NGOs, and donors, preventing holistic analysis and accountability (Nkonki-Mandleni & Adelekan, 2021). Equally critical is the shortage of skilled personnel — few African institutions employ professional archivists or

data stewards (Ngulube, 2022), leaving records vulnerable to loss. Politically, weak enforcement of data policies and the colonial pattern of data extraction — where international partners collect and control African-generated data — raise urgent questions about sovereignty and justice (Open Earth Foundation, 2023). As one Ghanaian officer lamented, “When the project ends, the laptop is taken, and the knowledge disappears” (ICA-PUCK, 2022). This institutional amnesia reflects a broader undervaluation of records as strategic assets. Until records management is prioritised in national climate strategies and budgets, Africa’s climate memory will remain fragile, fragmented, and at risk.

Table 4: Pathways to Equitable and Resilient Digital Memory Systems

Pathway	Action	Expected Outcome	Supporting Source(s)
Policy Integration	Enact national digital archiving laws	Institutionalise climate data preservation	AUC (2022), AUDA-NEPAD (2022)
African-Led Infrastructure	Develop AU or regional digital repositories	Ensure data sovereignty and access	African Academy of Sciences (2024), WRI (2023)
Capacity Building	Train records managers, archivists, IT staff	Strengthen local stewardship	Mutula (2021), Ojedokun & Abidoye (2020)
Community Inclusion	Integrate oral histories, local knowledge	Make systems inclusive and culturally grounded	Ngulube (2023), SEI (2022)
Ethical & Technical Standards	Adopt ICA, ARMA, and FAIR principles	Ensure integrity, interoperability, and accountability	ICA (2021), ARMA (2020), FAO (2023)
Regional Collaboration	Shared platforms (e.g., WASCAL)	Enhance resilience through collective action	UNEP (2023), AfriGAP (2022)

Table 4 outlines a transformative roadmap for building digital memory systems that are not only functional but also equitable, inclusive, and resilient. The most critical pathway is policy integration, where national governments adopt laws that designate climate data as a public good and assign custodianship to national archives (AUC, 2022; AUDA-NEPAD, 2022). Without this, sustainability remains aspirational. Equally vital is African-led infrastructure, continent-owned repositories that prevent data colonialism and ensure sovereignty (African Academy of Sciences, 2024). Capacity building is foundational: training a new generation of African records professionals will shift reliance from foreign experts to local stewards (Mutula, 2021). The inclusion of oral histories and Indigenous knowledge ensures that digital systems do not erase local ways of knowing (Ngulube, 2023). Ethical frameworks, such as ICA's archiving principles and FAIR data standards, provide global benchmarks adapted to African contexts. Finally, regional collaboration through platforms like WASCAL fosters shared learning and resilience (UNEP, 2023). Together, these pathways form a justice-oriented vision: one where digital records are not tools of control, but instruments of empowerment. They affirm that Africa's climate future must be built on a foundation of memory, not amnesia.

Discussion

This systematic review has demonstrated that digital records are central to Africa's climate action, yet their long-term preservation remains fragile, fragmented, and under-prioritised. Across 67 sources (2019–2025), a consistent pattern emerges: while innovation in digital climate tools is flourishing, from national dashboards to community-based GIS, the systems designed to remember, learn, and scale these efforts are critically underdeveloped.

The findings confirm that digital records are no longer peripheral to climate governance; they are core infrastructure. In Rwanda, Kenya, and Nigeria, digital platforms now track reforestation, emissions, and adaptation in real time (UNFCCC, 2023; Abubakar et al., 2022). In Ethiopia and Senegal, mobile advisories and participatory mapping are empowering farmers and coastal communities (USAID, 2023; SEI, 2022). These are not just technical upgrades; they represent a new era of data-driven climate resilience.

Yet, as this review reveals, functionality does not guarantee sustainability. Most systems are donor-funded, project-based, and lack institutional anchoring (World Bank, 2024; Mbeche et al., 2022). When funding ends, so does the data. This phenomenon, termed “data

orphanhood”, undermines accountability, erodes institutional memory, and perpetuates a cycle of reinventing the wheel in climate programming. As one records officer in Ghana lamented: “When the project ends, the laptop is taken, and the knowledge disappears” (ICA-PUCK, 2022, p. 14). The barriers are not merely technical. While infrastructure gaps and obsolete formats are real challenges (ITU, 2022; Mutula, 2020), the deeper issues are institutional and political. Data is siloed, skills are scarce, and records management is often seen as administrative drudgery, not strategic intelligence (Ngulube, 2022; Aboyade, 2020). More troubling is the colonial continuity in data governance: much climate data is collected by international partners, stored abroad, and accessed on their terms (Open Earth Foundation, 2023). This is not just inefficiency; it is a crisis of sovereignty and justice.

However, the review also uncovers reasons for hope. Emerging models, regional hubs like Climate Watch (WRI, 2023), national archives integrating climate records (Ngulube, 2022), and MRV systems institutionalised under the Paris Agreement (GCF, 2023), show that sustainable digital memory is possible. The key is intentionality: treating records not as by-products, but as public goods that must be preserved, protected, and democratised.

This leads to the core argument of this study: sustainable digital records management is not a technical fix; it is an act of climate justice. It ensures that the struggles, innovations, and resilience of African communities are not erased, but archived, honoured, and built upon. It enables intergenerational accountability, a moral imperative in a crisis that spans decades.

The proposed “Towards African Climate Memory” framework offers a transformative vision: one where digital systems are functional, equitable, and resilient, grounded in African-led policy (AUC, 2022), community inclusion (Ngulube, 2023), and ethical standards (ICA, 2021). It calls for a paradigm shift, from managing data to stewarding knowledge.

Conclusion

Africa's climate resilience is increasingly data-driven, yet digital records remain poorly preserved, risking the loss of hard-won knowledge. This review shows that while digital tools are used in climate monitoring, early warnings, and community adaptation, most systems are project-based, donor-dependent, and collapse when funding ends. Technical, institutional, and political barriers, including data silos, skills gaps, and weak data sovereignty, undermine long-term stewardship.

Sustainable digital records management is not a technical afterthought but a strategic imperative for accountability, learning, and climate justice. Africa needs resilient systems that preserve knowledge across generations.

Recommendations

African Union and regional bodies must establish a pan-African climate data repository based on FAIR principles and African ownership.

Donors should require data preservation plans and fund long-term stewardship, including training for records professionals.

Academic and research institutions should adopt trusted digital repositories and integrate Indigenous knowledge into digital archives

Libraries and archives must be repositioned as centres of climate memory, ensuring intergenerational access.

The goal is not more data, but better memory. By safeguarding digital records, Africa can ensure that every climate action, from a farmer's adaptation to a national policy, leaves a lasting legacy. In the face of escalating climate impacts, remembering is resilience. Africa's future depends not only on what we do, but on what we preserve. Let us build digital memory systems that are functional, inclusive, and enduring, so that progress is never forgotten, and justice is written into the record.

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