



Tokenisation of Real-World Assets in African Capital Markets: Regulatory Models, Investor Protection and Responsible Adoption

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Abstract

This study examined the institutional and regulatory conditions under which tokenised real-world assets could support capital formation and investor access in African capital markets. A pragmatic qualitative design combined an integrative literature review with structured multiple-case documentary analysis of Nigeria, South Africa, Kenya and Mauritius, using Singapore as an international comparator. Forty-eight peer-reviewed and official documents published between 2020 and 2026 were analysed using content and framework analysis, cross-case comparison, pattern matching, gap analysis and a documentary Tokenisation Readiness Index. Government bonds and regulated investment funds emerged as the most suitable early-stage applications, whereas real estate, infrastructure, private credit and environmental assets required stronger title, valuation, custody and liquidity safeguards. Singapore demonstrated advanced readiness, while the four African jurisdictions were substantially prepared but retained material gaps in ownership recognition, settlement integration, insolvency treatment and cross-border compatibility. Tokenisation could lower investment thresholds, extend digital distribution and automate selected compliance and settlement functions, but could not independently create liquidity, cure defective title or guarantee investor protection. The study developed a six-pillar responsible-adoption framework and four-phase implementation roadmap. It concluded that tokenisation could support African capital-market development where investor claims were legally enforceable, underlying assets verifiable, client assets segregated, settlement final, intermediaries accountable and regulatory institutions technically capable of effective supervision.

Keywords: African capital markets, Asset tokenization, Digital securities, Investor protection, Real-world assets, Regulatory readiness.

1. Introduction

1.1. Background to the Study

Financial-market digitalisation has progressed beyond electronic record keeping towards the issuance, transfer and settlement of financial claims on programmable platforms. Asset tokenisation represents one aspect of this transition. It involves creating a digital representation of rights or claims relating to a financial or real asset and recording those rights on a distributed or programmable ledger. In principle, tokenisation can integrate information on ownership, transfer conditions and transaction execution within a common digital environment, reducing some reconciliation requirements associated with fragmented conventional infrastructures (Bank for International Settlements [BIS], 2023; International Monetary Fund [IMF], 2026).

Institutional applications increasingly extend beyond speculative crypto-assets. Banks, asset managers, exchanges and financial-market infrastructures have tested tokenised bonds, investment funds, deposits and collateral arrangements. Programmable transfers, automated contractual processes and delivery-versus-payment mechanisms can reduce selected operational frictions and counterparty exposures. These efficiencies are not costless. Near-instant settlement may increase intraday liquidity requirements, operational dependence and the speed through which financial stress is transmitted (Davé et al., 2026; IMF, 2026). The BIS (2025) therefore envisaged regulated arrangements in which tokenised financial assets operate alongside commercial-bank money and central-bank settlement assets.

Potential applications include equities, government and corporate bonds, investment funds, real estate, commodities, infrastructure projects and private-credit portfolios. Fractionalisation may reduce minimum investment sizes and extend regulated investment products to investors previously constrained by high entry thresholds. Tokenisation may also automate distributions, compliance conditions and selected post-trade processes. Yet fractionalisation does not itself create diversification, liquidity or investor protection. Liquidity continues to depend on active buyers and sellers, credible price discovery, enforceable claims and reliable market infrastructure (Proskurovska & Birch, 2025).

These limitations are especially relevant to African capital markets. Many remain characterised by relatively few listed securities, narrow investor participation, weak secondary-market liquidity, fragmented post-trade systems and costly cross-border arrangements (International Finance Corporation [IFC], 2023). Although African

equity-market capitalisation expanded considerably between 2000 and 2024, the number of listed companies did not increase proportionately and corporate bond development remained uneven (Organisation for Economic Co-operation and Development [OECD], 2025). Tokenisation could address selected constraints through fractional subscriptions, digital distribution and programmable compliance. It cannot, however, compensate for poor asset quality, weak disclosure, unstable macroeconomic conditions, inadequate investor education or insufficient secondary-market demand. A digitally represented illiquid claim may remain illiquid.

Regulatory developments across Africa show growing but uneven preparation. Nigeria introduced rules governing digital-asset issuance and service providers, established the Accelerated Regulatory Incubation Programme and admitted firms testing real-world asset tokenisation, real-estate tokenisation and digital custody. The Investments and Securities Act 2025 strengthened the statutory treatment of virtual assets, although the relationship between tokenised interests and established securities, property, custody and insolvency rules remains important (Securities and Exchange Commission Nigeria [SEC Nigeria], 2025, 2026).

South Africa adopted a function-based approach by bringing crypto-asset financial services within established licensing and anti-money-laundering supervision. Its developed exchanges, banking institutions, payments infrastructure and securities systems provide a comparatively strong institutional base, although crypto-asset classification does not independently resolve legal ownership of tokenised external assets. Kenya has used its capital-market sandbox to test real-estate and tokenised-securities arrangements, while Mauritius established a dedicated virtual-asset and token-offering regime supported by licensing and custody requirements (Capital Markets Authority Kenya [CMA Kenya], 2024; Financial Services Commission Mauritius [FSC Mauritius], 2022). These initiatives indicate regulatory movement but do not yet constitute an integrated African market for tokenised securities.

An important distinction concerns the legal nature of digital instruments. A tokenised security represents, or may itself constitute, a regulated investment claim such as a share, bond or fund interest. A stablecoin primarily performs a payment, settlement or store-of-value function linked to a reference asset. A utility token generally grants access to a product or service, while an unbacked cryptocurrency does not ordinarily represent an enforceable claim against an issuer or identifiable pool of real-world assets. Treating these instruments as a single category obscures significant differences in economic substance, investor rights and regulatory treatment.

More fundamentally, control of a digital token does not automatically establish legal ownership of the underlying asset. Property, company or securities law may recognise ownership through a land registry, shareholder register, central securities depository, custodian record or legally valid contractual arrangement. A token may therefore represent a direct proprietary right, beneficial interest, debt claim or contractual entitlement. Its credibility depends on the legal relationship between the token and the underlying asset, the issuer's authority, custody arrangements, competing claims and remedies available upon default or insolvency. Responsible tokenisation consequently requires alignment between the digital record and legally enforceable rights.

1.2. Research Problem and Knowledge Gaps

African capital markets require broader investor participation and more efficient channels for financing governments, enterprises, housing and infrastructure. Yet high transaction and issuance costs, relatively small investor bases, limited liquidity, fragmented market infrastructure and weak cross-border integration continue to constrain market development (IFC, 2023; OECD, 2025). Tokenisation may address parts of these constraints by reducing investment-unit sizes, digitising distribution, automating selected compliance functions and improving transaction processing.

The central problem is that technical functionality does not establish legal or economic effectiveness. A smart contract may execute a transfer correctly while the recipient acquires no enforceable interest in the underlying security, property, commodity or loan. Digital custody may protect cryptographic keys without protecting the referenced asset. Blockchain transparency may record transactions accurately while failing to reveal off-chain encumbrances, competing ownership claims or deterioration in asset value. Tokenisation may therefore reduce some transaction frictions while creating or amplifying legal, operational, cybersecurity and governance risks.

Regulatory treatment is also dispersed across securities, company, property, custody, payments, settlement, insolvency, data-protection and anti-money-laundering regimes. These bodies of law may differ in their treatment of ownership, transfer, possession, settlement finality and investor recourse. Regulatory sandboxes permit controlled experimentation but do not necessarily determine tokenholder rights during intermediary failure, fraudulent asset substitution or issuer insolvency. Responsible regulation must therefore address the full lifecycle of tokenised assets rather than issuance and platform licensing alone (IOSCO, 2025).

Five knowledge gaps remain evident. First, a conceptual gap arises from studies that combine tokenised securities, stablecoins, utility tokens and unbacked cryptocurrencies despite their different economic functions and legal rights. Second, an empirical gap persists because evidence on cost reduction, liquidity and investor inclusion is drawn largely from pilots and relatively small markets. Fractional access may lower entry barriers without improving diversification, liquidity or investor welfare (Proskurovska & Birch, 2025).

Third, a regulatory gap arises because securities classification and virtual-asset licensing are frequently examined without adequate integration of custody, ownership records, settlement finality, smart-contract governance, insolvency and cross-border recognition. Fourth, a geographical gap exists because African jurisdictions remain underrepresented in tokenisation research, which has concentrated more heavily on cryptocurrencies, central-bank digital currencies and payments than on regulated tokenisation of productive assets. Fifth, a practical gap remains because existing frameworks rarely specify minimum institutional readiness conditions, enforceable investor safeguards and an appropriate sequence for implementation.

This study addressed these gaps through an integrative review and structured comparison of Nigeria, South Africa, Kenya and Mauritius, with Singapore serving as an international comparator. Tokenisation was examined as a regulated institutional arrangement rather than solely as a technological innovation.

1.3. Research Questions

The central research question was:

Under what institutional and regulatory conditions can tokenised real-world assets improve capital formation and investor access in African capital markets?

The study addressed the following specific questions:

1. What real-world assets and capital-market activities are most suitable for tokenisation in African markets?
2. How are tokenised securities classified and regulated across the selected jurisdictions?
3. What investor-protection, custody, settlement and market-integrity risks arise from tokenisation?
4. How prepared are the selected African jurisdictions for responsible tokenisation?
5. What regulatory framework and implementation sequence should guide responsible adoption in African capital markets?

1.4. Research Objectives

The general objective was to examine the institutional and regulatory conditions under which tokenised real-world assets could support capital formation and investor access in African capital markets.

The specific objectives were to:

1. identify capital-market asset classes and activities suitable for tokenisation;
2. compare the regulatory treatment of tokenised securities across the selected jurisdictions;
3. assess the principal legal, operational and investor-protection risks associated with tokenisation;
4. evaluate the tokenisation readiness of the selected African jurisdictions; and
5. develop a responsible-tokenisation framework and phased implementation roadmap for African regulators.

1.5. Motivation and Significance of the Study

The study was motivated by the need to determine whether tokenisation could address identifiable constraints in African capital markets without transferring poorly understood risks to investors. Its principal contribution is the integration of technological design with the legal, regulatory and institutional arrangements required to make digital claims credible, transferable and enforceable. Rather than assuming that tokenisation produces capital-market development, the study identifies the conditions under which it may improve access and transaction efficiency while preserving ownership certainty, market integrity and investor protection.

For securities regulators and central banks, the analysis provides a basis for coordinating requirements governing issuance, settlement, custody, anti-money-laundering compliance and operational resilience. Exchanges and central securities depositories may use the findings to assess how distributed-ledger arrangements interact with established market infrastructure. Issuers, custodians and technology providers can apply the framework to asset selection, legal structuring, asset segregation, smart-contract assurance, cybersecurity and business continuity.

For investors, the study clarifies that possession of a digital token has economic value only where it carries clearly defined and enforceable rights against an issuer, asset or legally recognised vehicle. Investor protection consequently requires effective disclosure, asset verification, custody, suitability assessment, market-abuse controls, complaints procedures and insolvency protection.

The study also contributes a comparative African perspective to research linking financial innovation, institutional readiness, transaction costs and investor protection. For regional institutions seeking greater African capital-market integration, it identifies the need for compatible legal definitions, technical standards, supervisory cooperation and cross-border recognition. Its central premise is that credible tokenisation depends first on enforceable rights and accountable institutions, with technology serving those arrangements rather than substituting for them.

2. Literature Review

2.1. Conceptual Review

2.1.1. Real-World Assets

Real-world assets (RWAs) are identifiable financial, physical, contractual or intangible resources from which legally recognised ownership, income, payment or usage rights arise. Their economic value derives from an underlying asset, contractual obligation or revenue stream rather than from the scarcity of a blockchain-native token. Tokenisation therefore represents existing or newly constituted rights digitally; it does not create the underlying economic value (BIS, 2023; World Bank, 2023).

Capital-market RWAs include equities, government and corporate bonds, sukuk and other securities; real estate; infrastructure; commodities; private credit; investment funds; intellectual-property rights; and environmental assets. These classes differ materially in legal complexity and suitability for tokenisation. Financial securities and regulated funds generally benefit from established issuance, disclosure and ownership structures. Real estate often requires a special-purpose vehicle because legal title remains governed by land-registration systems. Infrastructure and private credit permit fractional participation but retain project, borrower and cash-flow risks. Commodity tokens require verified reserves and accountable custody, while environmental tokens depend on credible registries and assurance against double counting.

An asset is therefore suitable for tokenisation only where it is identifiable, legally transferable, independently valued, properly held and capable of generating enforceable rights. Digital representation cannot cure defective ownership, uncertain valuation or weak underlying cash flows. This distinction is particularly important where tokenisation expands retail access to assets previously available mainly to sophisticated investors.

2.1.2. Asset Tokenisation

Asset tokenisation represents economic or legal rights through programmable digital units that can be issued, held, transferred and settled on a distributed or comparable digital ledger. Tokens may embody ownership, income,

voting, redemption or collateral rights, but these rights derive from applicable law and contractual arrangements rather than from the technology alone.

A distinction exists between digitally native securities and tokenised conventional securities. Native digital securities are created and maintained on a digital ledger that serves as the authoritative ownership record. Tokenised conventional securities remain anchored to an existing security or conventional register. The latter arrangement can create duplicated records and reconciliation problems where digital and traditional ownership records diverge. Native issuance may avoid part of this duplication, provided applicable law recognises the digital ledger as legally authoritative.

Tokenised assets may also be fungible or non-fungible, fractionalised or whole, and issued through permissioned or permissionless systems. These technological characteristics do not determine legal classification. For regulated capital markets, permissioned arrangements have particular relevance because authorised participation can support customer identification, investor eligibility, sanctions screening and transaction monitoring.

Fractionalisation may lower minimum investment thresholds, but smaller units do not guarantee liquidity. Effective liquidity continues to require active trading, reliable information, credible price discovery and regulated secondary markets (Proskurovska & Birch, 2025). Tokenisation also retains significant off-chain dependencies. Asset valuation, physical custody, legal documentation, property registration, corporate actions and judicial enforcement may remain outside the ledger. Consequently, secure code cannot prevent defective title, inaccurate valuation or fraudulent off-chain information (Davé et al., 2026).

2.1.3. Tokenised Securities and Unbacked Cryptocurrencies

Tokenised securities should be distinguished from stablecoins, utility tokens and unbacked cryptocurrencies. A tokenised security represents an equity, debt, fund or comparable investment claim against an issuer, underlying asset or legally constituted vehicle. A stablecoin generally seeks to maintain value relative to a currency or reference asset and primarily performs payment or settlement functions. A utility token principally grants access to a product or platform, while an unbacked cryptocurrency normally represents no contractual claim against an identifiable issuer or underlying asset.

The distinction has direct regulatory consequences. Tokenised securities remain subject to securities-law requirements governing disclosure, issuer responsibility, custody, transfer, market conduct and investor recourse. Stablecoins may fall within payment, banking, e-money or specialised digital-asset regimes depending on their structure. Utility tokens are generally governed by contractual or consumer arrangements unless their economic features bring them within securities law. Unbacked cryptocurrencies are ordinarily regulated primarily through crypto-asset, market-conduct or financial-crime frameworks.

The appropriate principle is therefore technology-neutral regulation: equivalent economic activities and risks should receive comparable regulatory treatment irrespective of the technology used. A tokenised corporate bond should retain the disclosure, issuer-liability and market-abuse protections applicable to a conventional corporate bond even where smart contracts automate payment and settlement (IOSCO, 2025).

2.1.4. African Capital-Market Development

Capital-market development reflects the ability of financial markets to mobilise savings, provide long-term finance, facilitate investment and permit efficient risk transfer. Relevant dimensions include capital formation, market depth, investor participation, liquidity, transaction efficiency, affordability, product diversity and regional integration.

Many African markets remain relatively small, illiquid and fragmented. Listed companies are limited in several jurisdictions, corporate bond markets remain uneven, secondary trading is often shallow and cross-border issuance and settlement remain costly (IFC, 2023; OECD, 2025). These weaknesses constrain the capacity of formal markets to connect savings with productive investment.

Tokenisation could improve selected dimensions of market development by reducing minimum investment sizes, widening digital distribution, improving collateral mobility and automating some post-trade processes. Fractionalisation may increase entry-level access, while programmable settlement may reduce operational friction. Neither guarantees market depth or sustained liquidity. The quality of the issuer, underlying asset, disclosure and market infrastructure remains decisive. Tokenisation should therefore complement rather than substitute for broader reforms in financial literacy, disclosure, macroeconomic stability, institutional investment and regional market integration.

2.1.5. Regulatory and Institutional Readiness

Regulatory and institutional readiness refers to a jurisdiction's capacity to authorise, supervise and enforce tokenised capital-market activity while maintaining investor protection, market integrity and financial stability. Readiness extends beyond the existence of a digital-asset statute or regulatory sandbox.

Its principal components include legal recognition of electronic records and tokenised rights; consistent product classification; competent and coordinated regulators; reliable digital identity; effective custody and asset segregation; delivery-versus-payment arrangements and settlement finality; cybersecurity and data protection; anti-money-laundering controls; interoperable technical standards; and effective dispute resolution.

A critical issue is the distinction between custody of cryptographic keys and custody of the underlying asset. Protection of a wallet or private key is insufficient where the referenced property, security or commodity is not separately protected. Similarly, a transaction recorded irreversibly on a ledger requires legal certainty concerning ownership and settlement consequences.

Institutional readiness therefore exists when legal, operational and supervisory components function together. A jurisdiction may host active blockchain firms and regulatory experiments yet remain unprepared for market-scale tokenisation where ownership, custody, settlement or insolvency consequences remain uncertain.

2.1.6. Investor Protection

Investor protection comprises the legal and operational safeguards that allow investors to understand a tokenised product, verify their rights and obtain effective remedies. These protections become more important where fractionalisation extends complex or illiquid investments to retail participants.

Disclosure should identify the underlying asset, tokenholder rights, valuation arrangements, fees, technology, governance, transfer restrictions, conflicts of interest, custody arrangements, cybersecurity risks and insolvency consequences. Marketing should not imply that blockchain technology guarantees asset quality, liquidity or investment returns.

Suitability and appropriateness requirements should correspond to product complexity and investor sophistication. Low minimum subscriptions do not make private credit, property or infrastructure products inherently suitable for inexperienced investors. Client assets should be segregated from issuer and intermediary assets, and custody rules should allocate responsibility for keys, wallet recovery and off-chain assets.

Smart contracts require independent review because coding errors can automate incorrect transfers or payments. Regulatory controls should also address conflicts where one entity performs issuance, platform operation, valuation and custody functions. Market surveillance remains necessary for manipulation, wash trading and insider dealing.

Insolvency provides a decisive test of investor protection. The law should determine whether tokenised and underlying assets belong to investors, issuers, custodians or an insolvent intermediary's estate. A technologically secure entitlement provides limited protection if the tokenholder ultimately ranks as an unsecured creditor (IOSCO, 2025).

2.1.7. Responsible Tokenisation Adoption

Responsible tokenisation adoption refers to the controlled introduction of tokenised instruments within legally enforceable, operationally resilient and adequately supervised market structures. It requires technology-neutral and proportionate regulation based on the product, investor group, scale and risk of the activity.

Core requirements include clear rights to underlying assets, independent asset verification, transparent governance, qualified custody, asset segregation, smart-contract assurance, cybersecurity, interoperable settlement infrastructure and effective investor remedies. Tokenised platforms should also interact reliably with authorised identity systems, payment infrastructures and securities depositories.

Adoption should proceed sequentially. Legally straightforward and institutionally familiar instruments, particularly government bonds and regulated investment funds, provide more manageable starting points than disputed property, complex private credit or difficult-to-verify environmental assets. Controlled institutional pilots should precede unrestricted retail and cross-border distribution.

Successful adoption should therefore be judged by legal certainty, accurate settlement, total transaction costs, investor outcomes, market liquidity and effective supervision rather than by the number of tokenised products launched.

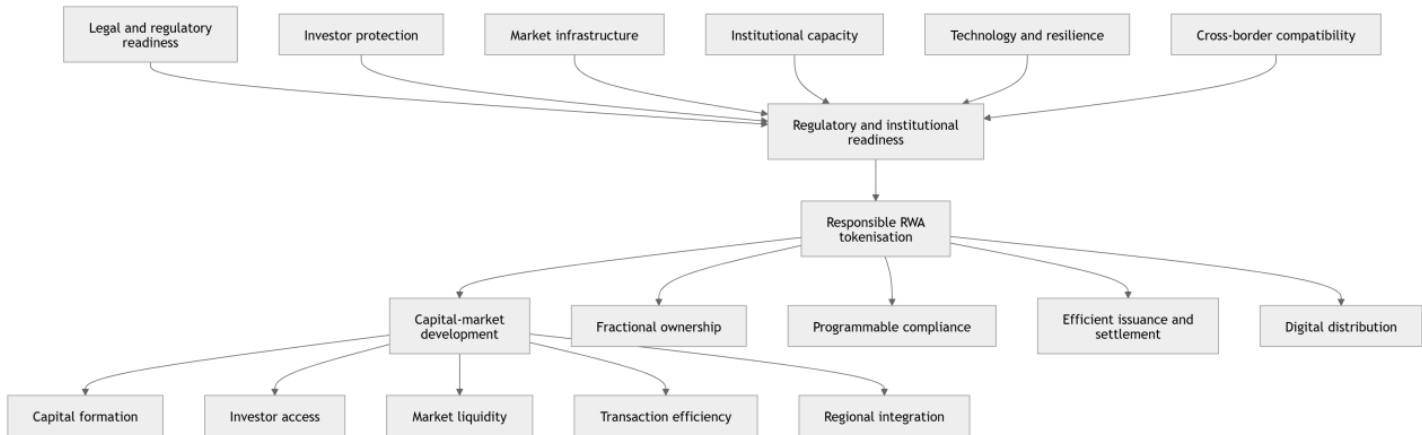


Figure 1. Institutional Pathway from Real-World Asset Tokenisation to African Capital-Market Development.
Source: Authors' conceptualisation based on BIS (2023, 2025), IOSCO (2025), IMF (2026) and OECD (2025b).

The figure positions regulatory and institutional readiness between tokenisation and capital-market outcomes. Its six readiness dimensions are legal and regulatory readiness, investor protection, market infrastructure, institutional capacity, technology and resilience, and cross-border compatibility. These conditions influence whether tokenisation can translate into capital formation, fractional ownership, programmable compliance, efficient issuance and settlement, and digital distribution.

Source: Authors' conceptualisation based on BIS (2023, 2025), IOSCO (2025), IMF (2026) and OECD (2025).

2.2. Theoretical Review

The study is anchored principally on Institutional Theory and Transaction Cost Economics.

Institutional Theory explains how laws, regulations, professional standards and established organisational practices shape the legitimacy and adoption of economic arrangements. Applied to tokenisation, the theory suggests that technologically similar platforms may produce different outcomes because jurisdictions differ in securities law, property rights, supervisory competence, settlement infrastructure and dispute-resolution mechanisms. A tokenised security becomes institutionally credible when issuers, investors, custodians, regulators and courts recognise compatible rules governing ownership, issuance, transfer and enforcement.

The theory is particularly relevant to the cross-country analysis because similar digital-asset licensing regimes do not imply equivalent tokenisation readiness. Nigeria, South Africa, Kenya and Mauritius may adopt comparable

regulatory terminology while maintaining different rules concerning property ownership, custody, insolvency and settlement. Regulatory convergence must therefore be distinguished from institutional equivalence.

Institutional Theory, however, provides limited explanation of whether tokenisation reduces transaction costs. Transaction Cost Economics, associated with Coase and Williamson, provides this complementary perspective. The theory explains institutional arrangements in terms of the costs of obtaining information, negotiating, monitoring, coordinating and enforcing transactions.

Conventional securities transactions involve issuers, brokers, exchanges, registrars, clearing institutions, central securities depositories, custodians, payment institutions and regulators. These intermediaries perform necessary functions, but fragmented systems create reconciliation, messaging and settlement costs. Tokenisation may consolidate selected records, automate compliance and corporate actions, and support delivery-versus-payment arrangements that reduce some coordination and counterparty costs (BIS, 2023; IMF, 2026).

Tokenisation does not necessarily eliminate intermediation or transaction costs. Legal structuring, asset verification, cybersecurity, smart-contract auditing, wallet recovery, interoperability and regulatory reporting generate additional expenses. Fractionalisation may also increase investor servicing and disclosure obligations. The appropriate efficiency test is therefore whether tokenisation reduces total lifecycle transaction costs after legal, technological and supervisory requirements are included.

The two theories are complementary. Institutional Theory identifies the legal, regulatory and organisational conditions required for credible adoption, while Transaction Cost Economics explains the channels through which tokenisation may improve or redistribute the costs of capital-market transactions. Together, they suggest that technical efficiency cannot generate sustainable market development where ownership, custody, settlement finality and investor remedies remain uncertain. Financial Innovation Theory and Investor Protection Theory provide supporting perspectives but are not treated as separate theoretical foundations.

2.3. Review of Empirical Studies

Empirical evidence on asset tokenisation remains promising but immature. Recent studies generally identify potential gains in access, transaction processing and programmability, while finding weaker evidence that tokenisation independently creates liquidity, lowers total costs or improves investor welfare.

Scharnowski (2026), using transaction-level data from fractional and continuously traded tokenised financial assets, found changes in trading behaviour and investor participation. The evidence supports the access argument but does not establish comparable effects in smaller or less liquid African markets. Aspris et al. (2026) similarly found that decentralised market structures did not automatically improve liquidity or efficiency; outcomes depended on trading architecture, concentration and intermediary roles.

Institutional evidence also challenges the assumption that tokenisation removes conventional intermediaries. Davé et al. (2026) found that practical tokenisation structures continued to depend on legal entities, custodians, compliance systems and data providers. Tokenisation therefore tended to modify the functions of intermediaries rather than eliminate them. The IMF (2026) reported that atomic settlement could reduce counterparty exposure and operational friction but warned that continuous settlement might increase intraday liquidity needs and accelerate financial-stress transmission.

Evidence across specific asset classes reinforces these qualifications. Tanveer et al. (2025) associated tokenisation with improved transparency and transaction coordination but found that outcomes depended on governance and reliable off-chain data. Tlili et al. (2025) found improved pricing efficiency in blockchain-enabled carbon markets only where sufficient liquidity existed. Manahov (2025) reported that cybersecurity incidents and volatility spillovers reduced efficiency and liquidity in digitalised real-estate markets. These findings indicate that digital representation alone does not transform inherently illiquid assets into liquid investments.

Research on investor access has produced similarly conditional results. Proskurovska and Birch (2025) found that fractionalisation could widen access while exposing small investors to concentrated, illiquid and poorly governed assets. Entry at a lower monetary threshold should therefore be distinguished from meaningful financial inclusion or improved investor welfare.

Regulatory and institutional studies identify legal certainty and infrastructure as central conditions. IOSCO (2025) found that traditional concerns relating to disclosure, conflicts of interest, custody and market abuse persisted in tokenised markets, alongside smart-contract, interoperability and operational risks. BIS (2025) identified tokenised government securities and regulated settlement money as promising components of integrated digital-market infrastructure but noted that much of the evidence remained pilot-based.

Earlier work supports these conclusions. Zhitomirskiy et al. (2023) demonstrated that securities-law restrictions and dividend distributions could be programmed into token designs, establishing technical feasibility without resolving liquidity or insolvency concerns. The World Bank (2023) identified fractional financing and transaction transparency as possible benefits of infrastructure tokenisation but found legal recognition, project preparation, investor protection and liquidity to be continuing constraints. OECD (2020) similarly identified regulatory uncertainty, weak interoperability and difficulties linking tokens to off-chain assets as major adoption barriers.

African evidence remains particularly limited. Kenya's capital-market sandbox has tested real-estate and tokenised-security arrangements, while Nigeria's regulatory incubation programmes have admitted real-world asset, real-estate tokenisation and custody initiatives (CMA Kenya, 2024; SEC Nigeria, 2025, 2026). These initiatives establish regulatory experimentation, but they do not yet provide strong evidence of sustained secondary-market liquidity, investor returns, insolvency outcomes or market-scale adoption.

Overall, the literature supports three conclusions. First, tokenisation can reduce minimum investment sizes, automate selected processes and improve transaction traceability. Second, these benefits depend on legal recognition, credible custody, reliable settlement, cybersecurity, investor protection and institutional capacity. Third, evidence remains insufficient regarding sustained liquidity, total lifecycle cost reduction, investor welfare and cross-border scalability.

The remaining gap is therefore less about whether tokenisation is technically feasible and more about the institutional conditions under which it can operate responsibly in African capital markets. Existing evidence is concentrated in developed markets, single platforms and pilot programmes, while African evidence remains mainly documentary and sandbox-based. This study responds by applying a common framework to Nigeria, South Africa, Kenya and Mauritius, benchmarked against Singapore, across legal recognition, custody, settlement, ownership records, investor protection, operational resilience and cross-border compatibility.

3. Methods

3.1. Research Philosophy and Design

The study adopted a pragmatic qualitative orientation because the research problem required the integration of legal, regulatory, institutional, technological and capital-market evidence. Two complementary designs were used: an integrative literature review and a structured multiple-case documentary analysis. The integrative review synthesised peer-reviewed studies, regulatory publications, market-infrastructure reports and international policy documents, while the documentary case analysis examined how tokenisation was treated within actual regulatory systems. The case jurisdictions were Nigeria, South Africa, Kenya and Mauritius, with Singapore serving as the international comparator.

A common analytical framework was applied to all jurisdictions. It covered legal classification, issuance and disclosure, custody, ownership records, settlement finality, smart-contract governance, anti-money-laundering controls, investor eligibility, secondary trading, cross-border recognition and insolvency treatment. The design assessed documented regulatory readiness and plausible mechanisms through which tokenisation could affect capital formation and investor access. It did not seek to establish a causal effect of tokenisation on capital-market development. Document identification and screening followed PRISMA 2020 transparency principles where applicable (Page et al., 2021).

3.2. Study Population

The study population comprised publicly available scholarly, legal, regulatory and institutional documents published or legally effective between 1 January 2020 and 31 July 2026. This period captured the recent shift from general blockchain experimentation towards regulated tokenisation and virtual-asset frameworks.

Eligible sources included securities and digital-asset laws, regulatory guidance, consultation papers, sandbox reports, stock-exchange and central securities depository rules, custody and settlement requirements, anti-money-laundering rules, relevant property, company and insolvency provisions, official tokenisation-project reports, international standards and peer-reviewed studies. The individual document constituted the unit of analysis, while each jurisdiction constituted the unit of comparison. Where several documents formed a single regulatory framework, they were coded individually but interpreted jointly to avoid overstating readiness on the basis of one broadly framed statute. International reports were used as benchmark evidence rather than jurisdictional observations.

3.3. Case Selection

Purposive maximum-variation sampling was used to select jurisdictions that differed in capital-market size, regulatory development, digital-finance experience and institutional structure. Selection required relevant market institutions, documented regulatory activity concerning digital assets or tokenisation, adequate authoritative materials and a distinct contribution to comparative analysis.

Nigeria represented a large African market with evolving statutory regulation and active regulatory incubation of tokenised products. South Africa provided a case with comparatively developed banking, exchange, payment and securities-settlement infrastructure and a function-based approach to crypto-asset financial services. Kenya combined extensive digital-finance experience with capital-market sandbox experimentation, including real-estate tokenisation. Mauritius contributed a small international financial centre with dedicated virtual-asset legislation, custody licensing and cross-border service experience. Singapore was selected as the international comparator because its Project Guardian programme provided an implementation-oriented benchmark involving tokenised funds, bonds, deposits and institutional settlement arrangements.

The cases were selected for analytical rather than statistical generalisation. Findings were therefore interpreted as evidence about institutional conditions and mechanisms rather than as continent-wide estimates.

3.4. Sampling and Eligibility Criteria

Purposive criterion sampling was used to identify documents capable of answering the research questions. Documents were included where they were published or legally effective between 2020 and 2026; addressed tokenised assets, digital securities, relevant market infrastructure or associated regulation; originated from credible scholarly or institutional sources; provided evidence on at least one analytical dimension; contained sufficient detail for coding; and were available in full text in English or an official English translation.

Documents were excluded where they were mainly promotional, anonymous, focused solely on unbacked cryptocurrencies, duplicated more authoritative material, lacked sufficient legal or operational detail, fell outside the study period or were unavailable in full text. Superseded rules were retained only when necessary to explain regulatory development; the latest operative version was used for scoring. Academic studies were assessed for relevance, methodological clarity and evidential quality, while legal materials were assessed for authenticity, legal status, issuing authority and jurisdictional application.

Screening proceeded through identification, duplicate removal, title and summary review, full-text eligibility assessment and final inclusion. Exclusion reasons were documented. No predetermined numerical sample was imposed because documentary saturation depended on adequate coverage of the analytical dimensions for each jurisdiction.

3.5. Data Sources and Search Procedure

Academic searches were conducted through Scopus, Web of Science and SSRN. Supplementary materials were obtained from the IMF, World Bank, BIS, OECD, IOSCO and Financial Action Task Force. Jurisdiction-specific evidence came from official securities regulators, central banks, finance ministries, stock exchanges, central securities depositories and legislative repositories.

The search strategy combined terms such as *real-world asset tokenisation*, *tokenised securities*, *security tokens*, *digital securities*, *asset tokenisation* and *distributed ledger capital markets* with terms covering investor protection, securities regulation, legal classification, settlement finality, digital custody, beneficial ownership, smart contracts, insolvency, regulatory sandboxes, capital-market development, cross-border recognition and the five case jurisdictions. Both British and American spellings of tokenisation were used. Reference lists of eligible studies and institutional reports were also searched for additional primary materials. General internet searches were used only to locate official records and were not treated as independent evidence.

3.6. Analytical Model

Capital-market-development potential was specified as a function of six interrelated readiness dimensions:

$$CMD_j = f(LR_j, IP_j, MI_j, OI_j, TI_j, CB_j)$$

where:

- CMD_j represents the capital-market-development potential associated with responsible tokenisation in jurisdiction j ;
- LR_j represents legal and regulatory readiness;
- IP_j represents investor-protection adequacy;
- MI_j represents market-infrastructure readiness;
- OI_j represents operational and institutional capacity;
- TI_j represents technological integrity and resilience; and

The model was analytical rather than econometric. It organised documentary evidence on the institutional conditions through which tokenisation could influence capital formation, investor access, liquidity and transaction efficiency, without assuming causal independence among the six dimensions.

Legal and regulatory readiness covered classification, enforceability, regulatory authority and insolvency treatment. Investor protection covered disclosure, suitability, segregation, complaints, compensation and recourse. Market infrastructure covered custody, ownership records, trading, clearing, settlement and settlement assets. Operational capacity covered supervisory expertise, inter-agency coordination and dispute resolution. Technological integrity covered cybersecurity, smart-contract governance, data protection and system resilience, while cross-border compatibility covered interoperability, mutual recognition, regulatory cooperation and anti-money-laundering consistency.

3.7. Tokenisation Readiness Index

A documentary Tokenisation Readiness Index (TRI) was constructed to support systematic cross-case comparison. Each indicator was scored on a four-point ordinal scale:

- 0 = Absent
- 1 = Recognised or under development
- 2 = Partially established, tested or legally incomplete
- 3 = Clearly established, legally supported and operational

The normalised index was:

$$TRI_j = \left(\frac{\sum_{k=1}^n w_k s_{jk}}{\sum_{k=1}^n w_k} \right) \times 100$$

where:

- TRI_j is the Tokenisation Readiness Index for jurisdiction j ;
- s_{jk} is the score assigned to jurisdiction j on indicator k ;
- w_k is the weight assigned to indicator k ; and
- n is the total number of indicators.

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The denominator incorporates the maximum indicator score of three, producing an index ranging from 0 to 100. Equal weights were applied in the principal analysis because the evidence did not provide an objective basis for assigning unequal weights. This also reduced the risk of discretionary weighting favouring a preferred conclusion. Readiness was interpreted as follows:

TRI Score	Readiness Classification
0.00–24.99	Nascent
25.00–49.99	Developing
50.00–74.99	Substantially prepared
75.00–100.00	Advanced

These categories reflected the documented readiness of the tokenisation framework rather than the overall quality of a jurisdiction's financial system. A sensitivity check using alternative pillar-level weights assessed whether the jurisdictional classifications remained materially unchanged.

3.8. Method of Analysis, Reliability and Research Integrity

Analysis proceeded through seven linked stages. Qualitative content analysis first identified explicit regulatory provisions, institutional arrangements and reported market practices. Framework analysis then organised the evidence within a jurisdiction-by-indicator matrix. Within-case analysis established each jurisdiction's regulatory and infrastructural position, followed by cross-case comparison of similarities and differences. Pattern matching examined whether stronger regulatory clarity, infrastructure and investor protection coincided with more developed tokenisation activity, without implying statistical causation. Documentary scoring converted the qualitative evidence into comparable pillar and index scores, while gap analysis identified absent, incomplete, contradictory or untested regulatory provisions. Reliability was strengthened through a coding manual that defined each indicator, scoring category and acceptable evidence type. Primary legislation and formal regulation were prioritised over consultation papers, speeches and secondary summaries. Where sources conflicted, the most recent legally authoritative document governed the coding decision, while discrepancies were retained in the research record. Regulatory claims were triangulated, where possible, across legislation, regulator guidance and market-infrastructure documents. A decision trail recorded search strategies, screening outcomes, exclusion reasons, source classifications, coding notes and scoring justifications. The analysis distinguished among rules formally enacted, arrangements tested through sandboxes or pilots, and systems demonstrated at market scale. This distinction prevented proposed or experimental initiatives from being scored as completed reforms.

Because the study relied solely on publicly available documents and collected no personal or confidential information, human-participant ethical risk was minimal. Promotional statements were not treated as verified market outcomes. The principal methodological constraints were unequal document availability across jurisdictions, rapid regulatory change and interpretive judgement in documentary scoring. Transparent eligibility criteria, triangulation, sensitivity analysis and cautious interpretation were used to limit these risks.

4. Results and Discussion

4.1. Profile of Reviewed Evidence

The search identified 124 potentially relevant records. After removal of 17 duplicates, 107 titles and summaries were screened. Thirty-eight records were excluded for limited relevance, leaving 69 documents for full-text assessment. A further 21 were excluded because they focused exclusively on unbacked cryptocurrencies, lacked sufficient regulatory detail, duplicated authoritative sources or had unverifiable publication authority. The final corpus comprised 48 documents. Of these, 18 were peer-reviewed studies and 30 were official materials, comprising 11 laws or regulations, 12 regulatory guidance, consultation or sandbox documents, and seven reports from international organisations and financial-market institutions. Seven documents primarily addressed Nigeria, six South Africa, five Kenya, five Mauritius, eight Singapore and 17 international or comparative developments. Most documents were published between 2024 and 2026, reflecting the recent movement towards regulated tokenisation pilots and more specific digital-asset frameworks. The evidence remained uneven. Singapore provided the strongest documentation on institutional pilots, technical standards and settlement arrangements, whereas the African cases offered stronger evidence on licensing and regulatory experimentation than on completed issuances, sustained secondary trading or investor outcomes. The findings therefore indicate comparative regulatory readiness rather than a causal effect of tokenisation on capital formation.

4.2. Tokenisation Use Cases by Asset Class

Table 1 summarises the relative suitability of major asset classes for tokenisation.

Table 1. Comparative Assessment of Tokenisation Use Cases.					
Asset Class	Legal Complexity	Investor-Access Potential	Liquidity Potential	Operational Risk	Overall Assessment
Government bonds	Moderate	High	High where active debt markets exist	Moderate	Strong early-stage use case
Corporate bonds	Moderate – High	High	Moderate	Moderate–High	Suitable with strong disclosure
Equities	High	High	Moderate–High	High	Requires authoritative shareholder records
Real estate	High	High	Moderate	High	Best through regulated vehicles
Infrastructure	High	High	Low–Moderate	High	Appropriate for professionally structured projects
Commodities	Moderate	Moderate – High	Moderate–High	High	Depends on reserve verification and custody
Private credit	High	Moderate – High	Low–Moderate	High	Better suited initially to qualified investors
Investment funds	Moderate	High	Moderate–High	Moderate	Practical route to diversified tokenisation
Green/environmental assets	High	High	Low–Moderate	High	Requires credible verification and registries

Government bonds emerged as the strongest initial use case because sovereign debt already possesses identifiable issuers, standardised terms, established disclosure and recognised settlement systems. Tokenisation could lower minimum subscriptions, automate interest payments and improve collateral mobility. These benefits remain dependent on active secondary markets and reliable settlement money.

Corporate bonds offer similar opportunities but carry greater credit and disclosure risk. Equities are more complex because token records must correspond with shareholder registers, voting rights, dividends, transfer restrictions and corporate actions. Tokenisation cannot substitute for weak issuer governance or incomplete ownership records.

Real estate offers high access potential through fractional ownership, but land-law and registry requirements make direct tokenisation legally complex. A more workable structure is likely to involve tokens representing shares or beneficial interests in a regulated special-purpose vehicle holding the property. Valuation, rental income, management costs and insolvency rights must nevertheless remain explicit.

Infrastructure tokenisation could mobilise domestic savings for energy, transport, telecommunications and housing, but construction, tariff, political and maturity risks remain. Initial applications should therefore favour completed, income-generating assets with verifiable cash flows. Commodity tokenisation similarly depends on independently verified reserves, secure storage and enforceable redemption. Private credit remains comparatively risky for unrestricted retail distribution because tokenisation does not remove borrower opacity or default risk.

Regulated investment funds provide a comparatively practical entry point because they combine diversification with established governance, valuation and redemption structures. Environmental assets may also benefit from digital traceability, but credible registries and independent verification remain essential. Overall, government bonds and regulated investment funds provide the strongest early-stage applications, while real estate, infrastructure, private credit and environmental assets require tighter safeguards.

4.3. Jurisdictional Findings

4.3.1. Nigeria

Nigeria moved from regulatory caution towards formal recognition and controlled admission of digital-asset businesses. The Investments and Securities Act 2025 strengthened the Securities and Exchange Commission's authority over virtual assets, exchanges and related operators. Regulatory incubation also admitted firms involved in real-world asset tokenisation, real-estate tokenisation and digital custody. In 2026, a specific capital category for real-world asset tokenisation and offering platforms further recognised tokenisation as a distinct regulated activity.

Nigeria's main strengths were regulatory direction, investor-access potential and experimentation. Its principal gaps concerned the legal relationship among the token, underlying asset and authoritative ownership record. Securities, land, company and insolvency rules did not yet provide a fully integrated treatment of tokenised ownership. Custody rules also needed to distinguish private-key safekeeping from legal custody of the referenced asset. The jurisdiction was therefore suitable for controlled pilots, but wider retail adoption required clearer title, custody, disclosure and insolvency provisions.

4.3.2. South Africa

South Africa possessed the strongest conventional capital-market and post-trade infrastructure among the African cases. Crypto-asset service providers were brought within financial-sector licensing and anti-money-laundering supervision, supported by established exchanges, depositories, payment infrastructure and market-conduct institutions.

Its weakness was more legal than infrastructural. Classification of crypto assets as financial products regulates services surrounding them but does not, by itself, determine whether a token represents a share, beneficial property interest or direct proprietary right. Existing securities and financial-sector laws can regulate many instruments according to economic substance, but token-specific ownership, smart-contract and insolvency questions remain partly dependent on general law. South Africa was therefore strong in infrastructure and supervisory capacity but less complete in asset-specific legal treatment.

4.3.3. Kenya

Kenya combined extensive digital-finance capability with an evolving capital-market innovation framework. Its regulatory sandbox admitted tokenised-securities experimentation, initially focused on real estate, while the Virtual Asset Service Providers Act 2025 and implementing regulations strengthened the formal basis for licensing and supervision.

The jurisdiction benefited from digital identity experience, widespread digital payments and regulatory experimentation. However, completed tokenised-securities transactions remained limited, and the relationship among virtual-asset licensing, securities offerings, land ownership, custody and settlement required further clarification. Market-scale adoption therefore depended on authoritative ownership records, qualified custody, secondary-market rules and tested investor remedies.

4.3.4. Mauritius

Mauritius had the clearest dedicated virtual-asset regime among the African cases. The Virtual Asset and Initial Token Offering Services Act 2021 established licensing categories for brokers, wallet providers, custodians, advisers, marketplaces and token-offering issuers. The existence of a specific virtual-asset custodian licence was a notable institutional strength.

Its international financial-centre orientation and experience with fund structures strengthened its potential for cross-border tokenised investment vehicles. Yet virtual-asset licensing did not amount to a complete tokenised-securities framework. Securities, company, fund and insolvency law continued to govern the legal substance of underlying claims. Mauritius therefore demonstrated strong licensing, custody and cross-border orientation but required closer integration between token regulation and conventional asset-right regimes.

4.3.5. Singapore as International Comparator

Singapore provided the most developed implementation-oriented model. Through Project Guardian, the Monetary Authority of Singapore coordinated regulated institutions in testing tokenised funds, bonds, deposits, foreign exchange and collateral arrangements. More than 40 financial institutions had participated in trials by 2024, with later work addressing common infrastructure, legal structures, tokenised bank liabilities, continuous settlement and cross-border interoperability.

Singapore largely applied existing financial laws according to economic substance while using institutional pilots to resolve technical and operational issues. Its strengths were coordination, institutional participation, settlement experimentation, common standards and international cooperation. Remaining challenges included platform fragmentation, universal interoperability and the transition from institutional pilots to broad market liquidity. Singapore therefore represented an advanced benchmark rather than proof of complete market-scale tokenisation.

4.4. Comparative Regulatory Treatment

The comparison revealed a common reliance on substance-based treatment where tokens possess the characteristics of securities. The major differences lay in custody specificity, legal ownership, settlement integration, licensing architecture and institutional coordination.

Mauritius had the clearest activity-based virtual-asset licensing structure among the African cases. South Africa possessed the strongest conventional infrastructure. Nigeria showed the clearest recent formal recognition of real-world asset tokenisation as a distinct regulated activity, while Kenya combined a new statutory VASP framework with live securities-tokenisation experimentation. Singapore integrated legal rules, institutional participation and settlement experimentation most comprehensively.

A common weakness across the African cases concerned cross-border recognition and token-specific insolvency treatment. This is particularly important because an asset may be issued in one jurisdiction, held by a custodian in another, traded through a third and linked to property situated elsewhere. Without conflict-of-laws and mutual-recognition arrangements, technical transferability may exceed legal portability.

4.5. Benefits, Risks and Stakeholder Effects

The evidence supported conditional rather than universal benefits. Issuers could gain access to smaller investors, automated distributions and lower administrative friction but would incur costs for legal structuring, cybersecurity, platform integration and continuing disclosure. Retail investors could obtain smaller investment units and access a wider range of assets but remained exposed to illiquidity, misleading claims, technology failure and uncertainty concerning their legal rights.

Institutional investors could benefit from faster collateral movement, programmable compliance and improved record reconciliation but required legally final settlement and institutional-grade custody. Exchanges and depositories could develop new products, although uncoordinated platforms might fragment liquidity and duplicate existing infrastructure. Custodians would assume additional responsibilities concerning cryptographic keys, client-asset segregation and reconciliation between digital and conventional records.

Technology providers would become increasingly important through ledger infrastructure, identity systems, smart contracts and data-oracle services. This concentration creates outsourcing, continuity and operational risks. Regulators could benefit from more traceable transaction records and automated reporting, but effective supervision requires specialist technical capability and strong inter-agency coordination. Tokenisation therefore changes the form of financial-market activity without eliminating conventional disclosure, conduct, custody and market-abuse risks.

4.6. Investor-Protection Gap Analysis

The most significant common weakness was the gap between technical control of a token and legally enforceable ownership of the underlying asset. Disclosure requirements can be prescribed relatively easily, but ownership, insolvency and cross-border recognition require deeper legislative coordination. Smart-contract audits are also insufficient unless technical review is connected to securities, property and consumer-law requirements.

Investor protection should therefore extend across the entire product lifecycle. Pre-issuance controls should verify the underlying asset, issuer authority, valuation and smart contract. Distribution controls should address disclosure, investor suitability and transaction limits. Post-issuance protection should cover custody, corporate actions, market surveillance, complaints and insolvency. This lifecycle approach is stronger than reliance on platform licensing alone.

4.7. Comparative Tokenisation Readiness

The Tokenisation Readiness Index applied equal weights to the six dimensions in the analytical model. Scores represented documented regulatory conditions as at 31 July 2026.

Table 2. Comparative Tokenisation Readiness Index.								
Jurisdiction	LR	IP	MI	OI	TI	CB	Score (%)	Classification
Nigeria	2	2	2	2	1	1	55.6	Substantially prepared
South Africa	2	2	3	3	2	1	72.2	Substantially prepared
Kenya	2	2	2	2	2	1	61.1	Substantially prepared
Mauritius	2	2	2	3	2	2	72.2	Substantially prepared
Singapore	3	3	3	3	3	2	94.4	Advanced

Note: LR = legal and regulatory readiness; IP = investor protection; MI = market infrastructure; OI = operational and institutional capacity; TI = technological integrity and resilience; CB = cross-border compatibility.

Singapore's 94.4% score reflected strong coordination, institutional pilots and advanced settlement experimentation. South Africa and Mauritius each scored 72.2%, but for different reasons: South Africa's result was

mainly infrastructure-led, while Mauritius benefited from explicit licensing and international financial-service capability. Kenya scored 61.1%, reflecting digital-finance capability and regulatory experimentation, while Nigeria scored 55.6%, supported by explicit recognition of real-world asset tokenisation but constrained by weaker technical standards, cross-border compatibility and legal integration.

The scores should not be interpreted as measures of general financial-system quality or investment performance. They measure the completeness of the documented environment for controlled tokenisation. Sensitivity analysis did not alter the overall classification of Singapore as advanced and the four African jurisdictions as substantially prepared.

4.8. Discussion in Relation to the Theories

The findings supported Institutional Theory. Tokenisation activity was more developed where regulators created legitimacy through licensing, sandboxes, recognised legal categories and collaboration with established financial institutions. Singapore's position reflected coordinated action among regulators, banks, asset managers and international institutions. South Africa demonstrated how strong conventional institutions could support operational readiness without a separate comprehensive tokenised-securities statute. Nigeria and Kenya showed how regulatory incubation could provide provisional legitimacy while permanent rules continued to develop.

The evidence also showed that formal regulation alone was insufficient. Mauritius possessed an explicit virtual-asset statute, yet tokenised securities still depended on securities, property and insolvency law. This confirms that institutional readiness depends on coherent interaction among regulators, custodians, registries, depositories and courts.

Transaction Cost Economics received qualified support. Tokenisation could reduce reconciliation, record-maintenance, distribution and settlement costs through common programmable platforms, while smart contracts could automate payments and compliance. The evidence did not, however, establish net cost reductions across the complete transaction lifecycle. New costs arose from legal structuring, smart-contract assurance, cybersecurity, digital custody, platform integration, reporting and reconciliation with off-chain records. Tokenisation therefore changed the composition of intermediation costs rather than eliminating intermediation.

4.9. Six-Pillar Framework for Responsible Tokenisation

The comparative findings produced a six-pillar framework for responsible adoption:

- 1. Legal recognition and asset-right enforceability: Tokenised instruments should be classified according to economic substance, while the legal effect of ledger records and tokenholder rights during transfer, default and insolvency should be explicit.
- 2. Proportionate issuance and disclosure: Regulation should reflect asset complexity, investor category and offering size, with disclosure covering underlying assets, ownership structures, valuation, rights, fees, technology risks and exit arrangements.
- 3. Secure custody, settlement and ownership records: Rules should distinguish key custody from custody of the underlying asset, require asset segregation, identify the authoritative ownership record and provide legally final settlement through regulated money.
- 4. Investor protection and market integrity: Suitability controls, surveillance, conflict management, complaint mechanisms, compensation treatment and enforceable remedies should remain available.
- 5. Operational resilience and smart-contract governance: Platforms should maintain cybersecurity controls, independent audits, business-continuity arrangements, data protection and procedures for addressing unlawful or erroneous transactions.
- 6. Interoperability and cross-border cooperation: Regulators should develop compatible technical standards, information-sharing arrangements, coordinated AML/CFT controls and recognition of authorised platforms and custodians.

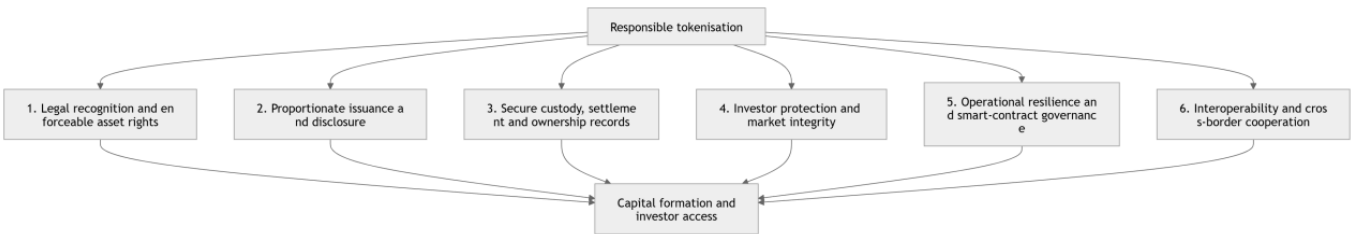


Figure 2. Six-Pillar Framework for Responsible Tokenisation in African Capital Markets.

Source: Authors' framework derived from the comparative documentary analysis.

The six pillars are interdependent. Technological resilience cannot compensate for legally unenforceable claims, just as legal recognition cannot protect investors where custody, settlement and market surveillance remain weak.

4.10. Phased Implementation Roadmap

The evidence supported a four-phase implementation sequence.

Table 3. Phased Implementation Roadmap.

Phase	Priority Actions	Intended Outcome
I. Legal and institutional preparation	Classify instruments; define ownership; allocate supervisory authority; establish disclosure, custody and insolvency rules	Legal certainty and regulatory accountability
II. Controlled experimentation	Use sandboxes; select suitable assets; limit investor exposure and transaction size; require verification and smart-contract audits	Evidence on functionality, costs and risks
III. Regulated market development	License issuers, platforms and custodians; integrate payment and settlement; establish trading and surveillance rules	Orderly commercial operation
IV. Regional interoperability	Develop mutual recognition; harmonise standards; coordinate AML/CFT supervision; test cross-border settlement	Scalable African tokenised markets

Phase I should precede large-scale public promotion. Law and regulation should first clarify whether a token represents direct ownership, beneficial ownership, a fund interest or a contractual claim. Phase II should prioritise government bonds, regulated funds and completed income-generating assets, with clear sandbox entry, reporting and exit requirements.

Phase III should follow only where pilots demonstrate sufficient legal, operational and commercial viability. At this stage, regulators may authorise secondary trading, qualified custody and settlement arrangements subject to surveillance and continuing disclosure. Phase IV should involve regional regulators, central banks, exchanges and depositories in mutual-recognition arrangements, harmonised standards and cross-border settlement testing. Regional recognition should remain conditional on comparable investor protection, AML/CFT standards and supervisory capacity.

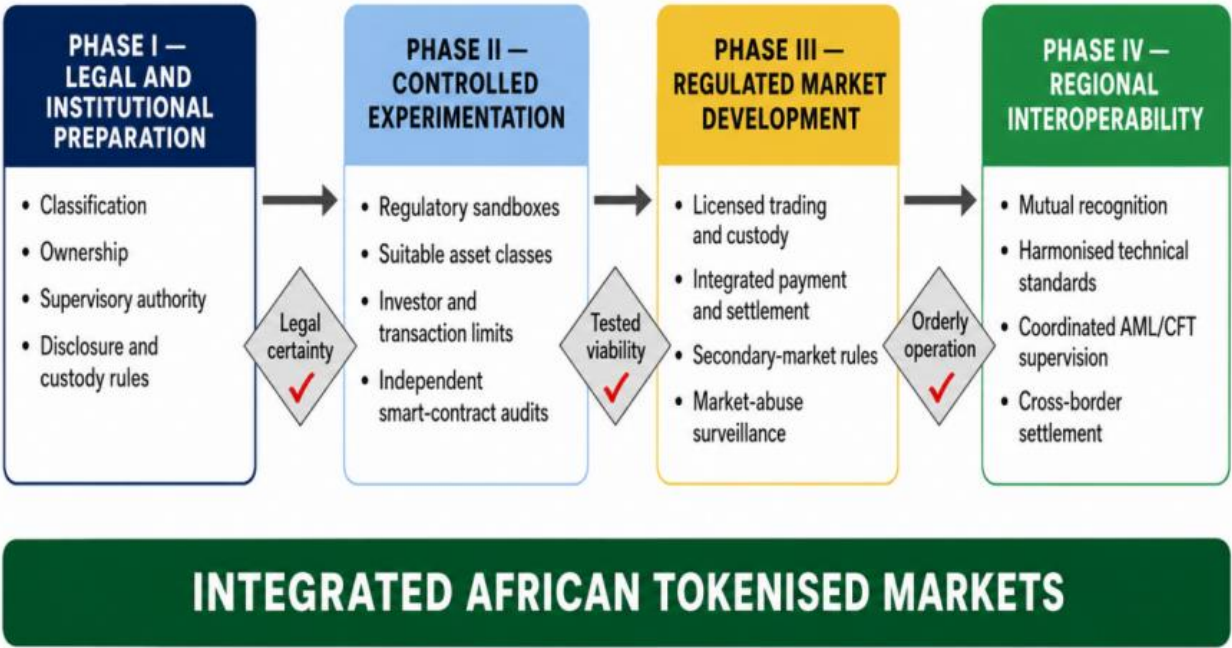


Figure 3. Phased Roadmap for Responsible Tokenisation in African Capital Markets.

Source: Authors’ phased implementation roadmap based on the study findings.

The overall evidence therefore supports sequenced and legally grounded tokenisation rather than rapid market expansion. Tokenisation can improve access and operational efficiency, but sustainable adoption depends on enforceable ownership, sound custody, legally final settlement, institutional capability and cross-border coordination.

5. Summary, Recommendations and Conclusion

5.1. Summary

This study examined the institutional and regulatory conditions under which tokenised real-world assets could support capital formation and investor access in African capital markets. Using an integrative literature review and structured multiple-case documentary analysis, it compared Nigeria, South Africa, Kenya and Mauritius, with Singapore serving as the international benchmark.

Regarding the first objective, the study found that several asset classes were technically capable of tokenisation, but their suitability differed materially. Government bonds and regulated investment funds emerged as the most practical initial applications because they possess identifiable issuers, standardised rights, established valuation arrangements and existing regulatory structures. Corporate bonds were also potentially suitable where issuer disclosure and credit assessment were strong. Real estate, infrastructure, private credit and environmental assets offered significant investor-access potential but carried greater risks relating to title, valuation, custody, cash-flow reliability and liquidity.

For the second objective, the jurisdictions demonstrated distinct regulatory approaches. Nigeria moved towards explicit recognition of real-world asset tokenisation and controlled regulatory incubation. South Africa relied mainly on function-based regulation and its established financial-sector infrastructure. Kenya combined regulatory sandbox experimentation with a statutory virtual-asset framework. Mauritius adopted an activity-based licensing regime covering virtual-asset intermediaries, custodians and marketplaces, while Singapore integrated existing financial regulation with coordinated institutional pilots, standards development and settlement experimentation.

Regarding the third objective, the principal risks concerned uncertainty over legal ownership, asset segregation, custody responsibility, smart-contract reliability, secondary-market manipulation, investor suitability, data protection and insolvency. A central finding was that control of a digital token did not necessarily confer legal ownership of the underlying asset. Fractionalisation could reduce entry thresholds but did not automatically produce liquidity, diversification or adequate investor protection.

For the fourth objective, the Tokenisation Readiness Index classified Singapore as advanced and the four African cases as substantially prepared, although their strengths differed. South Africa performed strongly in conventional market infrastructure and supervision, Mauritius in licensing and international financial services, Kenya in digital-finance capability and regulatory experimentation, and Nigeria in recent formal recognition of tokenisation activities. Cross-border recognition and token-specific insolvency treatment remained comparatively weak across the African cases.

For the fifth objective, the study developed a six-pillar framework covering legal enforceability, proportionate issuance and disclosure, secure custody and settlement, investor protection, operational resilience and cross-border cooperation. It also proposed a four-phase roadmap comprising legal and institutional preparation, controlled experimentation, regulated market development and regional interoperability.

Taken together, the findings indicate that tokenisation can support selected capital-market functions, but its contribution depends on institutional quality and regulatory sequencing. Technology can improve the form and processing of investment claims; it cannot substitute for enforceable ownership, credible asset verification, effective custody, liquid markets or competent supervision.

5.2. Recommendations

The recommendations arise directly from the findings and should be implemented in the sequence proposed by the responsible-tokenisation framework.

5.2.1. Securities Regulators

Securities regulators should apply substance-based classification so that tokenised instruments performing the economic function of securities remain subject to securities-law requirements. Specific rules should address tokenholder rights, disclosure, asset verification, qualified custody, smart-contract assurance, conflicts of interest, market surveillance and secondary trading.

Regulatory sandboxes should remain controlled testing arrangements rather than substitutes for permanent regulation. Admission should therefore specify testing periods, investor and transaction limits, reporting obligations, independent audits and consumer safeguards, with clear procedures for licensing, modifying or terminating an experiment after evaluation.

Regulators should initially prioritise government bonds and regulated investment funds before authorising unrestricted retail distribution of more complex property, infrastructure, private-credit and environmental products. This sequencing reflects the study's finding that legally standardised and verifiable instruments present lower early-stage implementation risk.

5.2.2. Central Banks

Central banks should work jointly with securities regulators, exchanges and central securities depositories to develop trusted settlement arrangements for tokenised securities. Controlled tests should examine tokenised commercial-bank money, wholesale central-bank money or other regulated settlement instruments capable of supporting legally final delivery-versus-payment. Such tests should assess liquidity needs, monetary integrity, operational resilience and settlement finality.

Central banks should also participate in cross-border settlement experiments because domestic tokenisation will have limited regional value where payment infrastructures, settlement standards and financial-crime controls remain incompatible.

5.2.3. Stock Exchanges and Central Securities Depositories

Exchanges and depositories should establish controlled tokenised-market segments that remain connected to authoritative ownership records. Common asset identifiers, interoperable settlement protocols, consolidated market surveillance and formal reconciliation procedures are required to prevent conflicting digital and conventional ownership records.

Existing infrastructure should be adapted where technically and economically feasible rather than automatically duplicated. This approach would reduce the risk that multiple token platforms fragment liquidity instead of improving market efficiency.

5.2.4. Legislators and Justice Institutions

Legislatures should clarify the legal status of tokenised records, smart contracts, beneficial interests and digital transfers. Securities, property, company and insolvency laws should identify the authoritative record of ownership and establish tokenholder priority where issuers, custodians or platforms become insolvent.

Courts, arbitration institutions and enforcement agencies should develop specialist competence in digital-asset disputes involving code, custody, property rights and multiple jurisdictions. Procedures should permit effective remedies for asset tracing, erroneous transfers, competing claims and interim protection of disputed assets.

This legal clarification is especially important because the study found that technological control of a token may exist even where legal title to the underlying asset remains uncertain.

5.2.5. Issuers and Financial Intermediaries

Issuers should structure tokenised products through legally recognised vehicles, independently verify underlying assets and disclose valuation methods, investor rights, expected cash flows, fees, transfer restrictions

and exit arrangements. Property, infrastructure and private-credit products should initially be restricted to suitably qualified investors where their complexity and illiquidity exceed ordinary retail-investor capacity.

Issuers and intermediaries should also conduct full lifecycle cost assessments before adoption. Assessments should cover legal structuring, technology integration, regulatory compliance, custody, cybersecurity, settlement, investor servicing and recovery arrangements. This is necessary because the findings indicate that tokenisation may redistribute transaction costs rather than eliminate them.

5.2.6. Technology and Custody Providers

Custody frameworks should clearly distinguish cryptographic-key management from legal custody of underlying assets. Providers should maintain client-asset segregation, robust key-control arrangements, recovery procedures, independent reserve or asset verification and appropriate insurance where available.

Smart contracts, data oracles and platform controls should undergo independent review before deployment and at appropriate intervals thereafter. Providers should maintain secure upgrade mechanisms, incident-response procedures, audit trails and processes for correcting transactions that are technically executed but legally invalid, fraudulent or erroneous.

5.2.7. Regional African Institutions

Regional cooperation should receive greater priority because cross-border compatibility emerged as one of the weakest readiness dimensions. The African Union, African Securities Exchanges Association, regional economic communities and relevant networks of central banks and securities regulators should develop compatible definitions, minimum custody standards, information-sharing arrangements and principles for mutual recognition.

Regional pilots should initially focus on government securities, regulated investment funds and verified income-generating infrastructure assets. Common technical standards and interoperable platforms should be tested before regional cooperation expands to more complex products.

Mutual recognition should remain conditional on comparable levels of investor protection, AML/CFT compliance, custody standards and supervisory competence.

5.2.8. Investor-Education Institutions

Investor education should distinguish clearly between tokenised securities, stablecoins, utility tokens and unbacked cryptocurrencies. Investors should be taught that a low subscription amount does not imply low investment risk and that digital accessibility does not guarantee liquidity.

Education programmes should encourage investors to verify the legal status of the token, the underlying asset, custody arrangements, fees, secondary-market liquidity, regulatory authorisation and insolvency rights before investing. This is particularly important where tokenisation extends complex assets to retail investors who previously could not access them because of high investment thresholds.

5.3. Conclusion

The study concludes that tokenised real-world assets can contribute to capital formation and investor access in African capital markets, but only under clearly defined legal, institutional and regulatory conditions. The principal potential benefits are lower investment thresholds, wider digital distribution, automated compliance and payment functions, improved transaction traceability and more efficient elements of settlement. These benefits are conditional rather than inherent consequences of distributed-ledger technology.

Responsible adoption requires legally enforceable tokenholder claims and identifiable, independently verifiable underlying assets. Client assets must be segregated, custody responsibilities clearly allocated and settlement legally final. Issuers, custodians, platforms and technology providers must remain accountable despite the use of automated or distributed systems. Regulators require adequate technical expertise, market-surveillance capacity and authority to coordinate securities, banking, property, insolvency, data-protection and anti-money-laundering rules.

The comparative analysis indicates that Nigeria, South Africa, Kenya and Mauritius have moved beyond regulatory absence and possess relevant foundations for controlled adoption. None, however, has completely resolved the combined issues of legal ownership, custody, settlement integration, insolvency and cross-border recognition. The appropriate near-term strategy is therefore controlled, legally grounded and sequenced adoption rather than rapid market expansion.

Tokenisation should ultimately be treated as a method of structuring, recording and transferring investment rights. Its contribution to African capital-market development will depend on whether it removes genuine market frictions while preserving legal certainty, investor protection, market integrity and financial stability.

5.4. Limitations and Further Research

The study had four principal limitations. First, it relied on publicly available documents and therefore could not examine confidential regulatory assessments, commercial agreements or internal project-performance information. Second, rapid changes in digital-asset regulation mean that some legal classifications, licensing arrangements and implementation practices may change after the study period.

Third, direct comparison was constrained by differences among national securities, property and insolvency laws. Although the common analytical framework improved comparability, identical readiness scores did not necessarily represent identical institutional strengths. Fourth, evidence from completed African tokenisation projects remained limited. Many initiatives were still at sandbox, pilot or early licensing stages, preventing firm conclusions about sustained liquidity, total cost reductions or long-term investor returns.

The Tokenisation Readiness Index also involved interpretive documentary scoring. Equal weighting and sensitivity analysis reduced, but did not eliminate, judgement in assigning scores. More importantly, the qualitative documentary design identified regulatory conditions, patterns and gaps but could not establish a causal relationship between tokenisation and capital-market development.

Further research should therefore incorporate primary evidence from regulators, exchanges, depositories, issuers, custodians, technology providers and institutional investors. Investor surveys could assess knowledge, willingness to participate, risk perception and responses to alternative disclosure and protection arrangements. Detailed project-level studies should examine completed tokenised issuances, including legal structures, issuance costs, secondary trading, custody, settlement and investor outcomes.

Transaction-level data would permit direct comparison of tokenised and conventional instruments in terms of issuance, intermediation, custody and settlement costs. Event studies could assess market responses to tokenised issuances and major regulatory announcements, while longitudinal studies could track changes in investor participation, liquidity, transaction costs, settlement failures and complaints before and after implementation. Such research would allow subsequent studies to test whether the institutional readiness identified in this study translates into measurable capital-market outcomes.

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