



**GREEN BONDS AND RENEWABLE ENERGY FINANCING IN KENYA:
OPPORTUNITIES AND CHALLENGES**

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Abstract

Green bonds have emerged globally as an innovative financial instrument to mobilize climate-aligned capital for sustainable development. In Africa, their uptake has been slow, but Kenya has shown early promise by pioneering regulatory frameworks and launching its first corporate green bond in 2019. Despite this progress, renewable energy financing through green bonds remains underexplored. The primary aim of the review was to systematically assess the role of green bonds in financing renewable energy projects in Kenya, identify enabling factors and constraints, and evaluate lessons for policy, practice, and future research. A systematic review was conducted following PRISMA guidelines. Twenty-one studies published between 2015 and 2025 met the inclusion criteria. Findings indicate that Kenya has developed robust regulatory frameworks through the Capital Markets Authority (CMA) and alignment with ICMA Green Bond Principles. Green bonds present clear opportunities for scaling geothermal, wind, and solar projects, consistent with Kenya's renewable energy dominance. However, uptake has been constrained by high issuance costs, lack of sovereign benchmarks, limited investor awareness, shallow secondary markets, and credibility concerns related to greenwashing. Comparisons with South Africa and Nigeria demonstrate the catalytic role of sovereign green bonds and blended finance models in market deepening. Green bonds hold significant potential to transform Kenya's renewable energy sector, but market growth requires sovereign issuance, stronger investor education, aggregation platforms for SMEs, and rigorous impact reporting. This review contributes diagnostic insights and a roadmap for actionable reforms, positioning green bonds as a key lever for achieving Kenya's energy and climate goals.

Keywords: *Green bonds; Renewable energy; Sustainable finance; Kenya; Africa; Climate-aligned investment*

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1 Introduction

Sustainable finance has gained significant prominence as countries grapple with the dual challenge of fostering economic growth while mitigating the adverse effects of climate change. Globally, innovative financial instruments such as green bonds have emerged as vital tools for channelling capital toward low-carbon, climate-resilient projects (Flammer, 2021). Africa, however, continues to face acute financing gaps for renewable energy infrastructure, despite its vast potential in solar, wind, hydro, and geothermal energy (IEA, 2019). In Kenya, where energy demand is rising rapidly, renewable energy development is a strategic priority under the country's Vision 2030 and the National Climate Change Action Plan (Government of Kenya, 2018). Green bonds provide an innovative pathway to address these financing gaps. Since the first issuance in 2007, the global green bond market has grown exponentially, surpassing USD 500 billion in annual issuance by 2021 (Climate Bonds Initiative, 2022). In Africa, Kenya made history in 2019 by issuing the first corporate green bond in East Africa, led by Acorn Holdings, which raised funds for sustainable student housing projects incorporating energy efficiency (CBK, 2020). This milestone positioned Kenya as a regional pioneer, yet questions remain about the scalability of green bonds in financing renewable energy infrastructure, where capital needs are larger and risks more pronounced.

Despite the promising potential of green bonds, scholarly evidence on their role in financing renewable energy in Africa remains fragmented. While studies highlight pricing advantages and environmental credibility in developed markets (Zerbib, 2019), the African experience is still emerging, with Nigeria's sovereign green bonds (2017, 2019) and South Africa's municipal issuances providing limited but valuable insights (World Bank, 2020; Goyal & Joshi, 2021). The Kenyan context is particularly underexplored, as research has not systematically reviewed how green bonds interact with renewable energy financing opportunities and challenges.

This study therefore undertakes a systematic review to synthesize available evidence on green bonds and renewable energy financing in Kenya, framed within the broader African and global context. By applying PRISMA-guided methodology, this paper critically examines the thematic opportunities and persistent barriers identified across 21 relevant studies. The goal is to generate actionable insights for policy, practice, and future research. Such a review is timely given Kenya's commitment to achieving 100% renewable energy by 2030, and the urgent global call for sustainable financing mechanisms to meet the United Nations Sustainable Development Goals (UN, 2021)

2 Literature Review

The concept of green bonds has gained prominence as a key financial innovation to mobilize resources for climate-friendly and sustainable projects. Initially pioneered in Europe and North America, the global green bond market has grown rapidly over the past decade, reaching trillions in cumulative issuances (Climate Bonds Initiative, 2022). These instruments are designed to channel capital specifically toward environmentally beneficial projects such as renewable energy, sustainable transport, and climate adaptation infrastructure. Several studies note that the market expansion has been facilitated by rising investor demand for Environmental, Social, and Governance (ESG) products and the establishment of frameworks such as the Green Bond Principles (GBP), which provide guidelines on transparency and accountability in bond issuance (Flammer, 2021).

In the African context, however, the uptake of green bonds remains relatively limited. Banga (2019) highlights that while Africa possesses vast renewable energy potential—particularly in solar, wind, and geothermal—capital inflows into these sectors remain insufficient compared to investment needs. Most African green bonds have been issued by sovereigns or development banks, with private sector participation lagging due to high issuance costs and the absence of deep domestic capital markets. Similarly, the OECD (2020) stresses that weak institutional capacity, regulatory gaps, and investor unfamiliarity with green financial products constrain the development of a robust market across the continent.

Kenya represents an interesting case study within this landscape. The country has been at the forefront of renewable energy development in sub-Saharan Africa, with geothermal and wind projects making significant contributions to its power generation mix (IRENA, 2022). However, financing challenges persist, especially for smaller-scale solar projects targeting rural electrification. According to the World Bank (2020), conventional financing mechanisms—such as commercial bank lending and donor grants—are inadequate to meet the growing demand for renewable energy investment. This has prompted policy discussions on leveraging green bonds to close the financing gap, reduce over-reliance on donor support, and attract international climate finance.

A growing body of literature explores the opportunities and risks associated with green bond issuance in developing economies. Zerbib (2019) empirically demonstrates that investors often accept slightly lower yields on green bonds compared to conventional bonds, reflecting a “greenium” effect that can reduce borrowing costs for issuers. Such findings are significant for Kenya, where renewable energy developers face high upfront capital costs. At the same time,

scholars caution that without robust verification and monitoring mechanisms, greenwashing risks may undermine investor confidence (Flammer, 2021). This reinforces the importance of adopting internationally recognized certification frameworks, such as those promoted by the Climate Bonds Initiative (2022), to ensure credibility.

Another recurring theme in the literature is the role of policy and institutional support. Koomson and Danquah (2022) argue that effective regulation, coupled with capacity-building for financial institutions, is essential to expand sustainable finance instruments in Africa. Evidence from other emerging markets suggests that sovereign issuances can play a demonstration role, signalling government commitment and crowding in private investment (World Bank, 2021). For Kenya, such an approach could provide the necessary market depth and investor confidence to scale up green bond financing for renewable energy projects.

Taken together, the reviewed literature underscores both the potential and constraints of using green bonds to finance renewable energy in Kenya. While global trends and empirical evidence point to clear benefits, including investor appetite and lower financing costs, the African experience highlights persistent structural barriers that must be addressed. These include limited market liquidity, high transaction costs, weak regulatory oversight, and low investor awareness. Understanding how these dynamics interact in the Kenyan context is essential to identify the opportunities and challenges that shape the role of green bonds in sustainable energy financing.

3 Methodology

This study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparency and replicability. Electronic databases searched included Scopus, Web of Science, JSTOR, and Google Scholar. The search string combined Boolean operators as follows: (“green bonds” OR “sustainable bonds”) AND (“renewable energy” OR “clean energy”) AND (“Kenya” OR “East Africa”). The search was conducted between April–July 2025, with a time restriction of 2015–2025 to capture contemporary evidence, as green bonds are a recent innovation. The review included peer-reviewed articles, policy papers, working papers, and reports that discussed green bonds in Africa (with a focus on Kenya), renewable energy financing, or sustainable finance instruments. Studies unrelated to finance or energy, studies outside Africa, and papers without empirical or policy relevance and those not in English language were excluded.

The search initially retrieved 178 records. After removing duplicates, 142 remained. Screening by title and abstract excluded 97 studies, leaving 45 for full-text review. Of these, 24 did not meet the inclusion criteria (either too general or outside Kenya), leaving 21 studies for final synthesis. The Critical Appraisal Skills Programme (CASP) and Joanna Briggs Institute (JBI) tools were applied to assess methodological rigor. Studies scoring below threshold quality were excluded (*See Appendix C*). Data were extracted on author, year, focus, methodology, variables analysed, and key findings. Synthesis was thematic, grouping results into:

- i. Policy and regulatory frameworks.
- ii. Opportunities for renewable energy financing.
- iii. Challenges and constraints.
- iv. Comparative insights from Africa.

4 Results

Of the 21 included studies, 12 were peer-reviewed journal articles, 6 were policy or working papers, and 3 were institutional reports (e.g., World Bank, IFC, FSD Africa). Studies spanned 2016–2025, with increasing publications in the past five years reflecting growing interest in sustainable finance. The systematic review yielded 21 studies and reports that met the inclusion criteria (*see Appendix B: Extraction Table*). These span academic articles, regulatory frameworks, market reports, and case studies. Together, they reveal important patterns in the evolution of Kenya's green bond and renewable energy financing landscape.

4. Discussion

The findings of this systematic review show that green bonds have become an increasingly important instrument for financing renewable energy projects in Kenya and across Africa. In Kenya, the issuance of the first certified green bond by Acorn Holdings in 2019 marked a pivotal step in mainstreaming sustainable finance, particularly by channelling capital towards environmentally aligned housing projects and energy-efficient infrastructure (Climate Bonds Initiative, 2019; Guarantco, 2020). While the Acorn case primarily targeted student housing, it highlighted the feasibility of mobilizing private capital through green bonds in Kenya's nascent market. The government and regulators, such as the Capital Markets Authority and the Nairobi Securities Exchange, have since established frameworks to guide issuers, thereby fostering transparency and investor confidence (CMA, 2019; NSE, 2019). These regulatory foundations provide opportunities to extend similar financing to renewable energy projects.

Comparative evidence from other African countries reinforces the potential of green bonds to mobilize substantial capital for renewable energy and climate-aligned investments. For

instance, Nigeria's sovereign green bonds—launched in 2017 and expanded in 2019—demonstrated strong investor appetite with over 220% subscription levels (Debt Management Office, 2019). Similarly, South Africa and Egypt have pioneered municipal and sovereign green bonds, respectively, with allocations directed to renewable energy, clean transport, and adaptation measures (City of Johannesburg, 2014; World Bank, 2022; Ministry of Finance & Vigeo Eiris, 2021). These cases underscore how government-backed issuances can attract both domestic and international investors, while Kenya's market remains largely private-sector driven. The contrast highlights opportunities for Kenya to diversify issuances beyond corporate-level bonds into sovereign or sub-sovereign frameworks that can fund large-scale renewable energy infrastructure.

Despite the opportunities, significant challenges persist. Chief among them are structural issues in Kenya's financial sector and wider African capital markets, including limited liquidity, shallow investor bases, and concerns about credit risk (Financial Sector Deepening Africa & Dalberg, 2025; London Stock Exchange Group, 2022). International studies also suggest that while investors increasingly value environmental responsibility, pro-environmental preferences often translate into modest pricing advantages, making cost reductions dependent on market maturity (Zerbib, 2019; Flammer, 2021). This finding aligns with observations in Kenya, where investors remain cautious due to unfamiliarity with the instrument, absence of benchmark sovereign green bonds, and perceived higher transaction costs compared to conventional bonds. These barriers limit the scalability of renewable energy financing via green bonds.

Opportunities, however, remain substantial. Kenya has a strong renewable energy base, with more than 80% of electricity generated from clean sources such as geothermal, wind, and hydro (IEA, 2024; Energy and Petroleum Regulatory Authority, 2024). Green bonds could therefore be strategically aligned to finance grid expansion, decentralized solar mini-grids, and energy access initiatives, consistent with climate finance flows already mapped by Climate Policy Initiative (2021). Global evidence indicates that renewable energy accounts for the largest share of green bond allocations, suggesting strong potential for replication in Kenya (CBI, 2024; IFC & Amundi, 2021). With targeted policy support, green bonds could provide a scalable financing pathway that complements donor-driven and concessional finance, while advancing Kenya's commitments under the Paris Agreement and its Vision 2030 development agenda.

Finally, this review highlights the importance of policy and institutional innovation. While Kenya has made progress with guidelines and certification standards, further integration into

fiscal policy—such as tax incentives, credit enhancements, or partial guarantees—could lower risks for investors (KBA & SBFN, 2019; New Climate Institute, 2021). Moreover, regional cooperation in green finance across Africa could broaden investor pools and harmonize standards, a step already advocated in pan-African reports (FSD Africa & Dalberg, 2025; LSEG, 2022). Without such measures, the challenges of low liquidity and limited awareness will continue to hinder the full potential of green bonds in financing renewable energy transitions.

5. Conclusion

This systematic review reveals that while green bonds hold substantial promise for advancing renewable energy financing in Kenya, the sector remains at an early stage of development. Evidence from the reviewed studies indicates that opportunities lie in Kenya's renewable energy potential, favourable policy signals, and growing investor interest in climate-aligned assets (World Bank, 2020; CBK, 2020). Furthermore, Kenya's pioneering corporate issuance demonstrates that green bonds can attract domestic and international investors, offering diversification and reputational benefits (Flammer, 2021). At the same time, significant challenges persist. These include underdeveloped domestic capital markets, high perceived risk of renewable energy projects, limited awareness among investors, and regulatory inconsistencies (Zerbib, 2019; Goyal & Joshi, 2021). Without addressing these systemic barriers, Kenya may struggle to leverage green bonds at scale for renewable energy projects. The review underscores the importance of strengthening regulatory frameworks, enhancing transparency through robust impact reporting, and building investor capacity to evaluate and support green finance instruments. The findings contribute to sustainable finance literature by situating Kenya within the global discourse on green bond markets, while highlighting the country's unique constraints and opportunities. For policymakers, the study emphasizes the need to create enabling environments that blend green bonds with complementary instruments such as guarantees, blended finance, and multilateral support. For researchers, future studies should focus on empirical assessments of green bond impacts on renewable energy deployment and explore comparative case studies across African markets. In conclusion, green bonds represent a strategic financing instrument for Kenya's transition toward a sustainable energy future. By mobilizing private and public capital, enhancing market confidence, and aligning with global sustainability agendas, green bonds could play a transformative role in closing the renewable energy financing gap—if their challenges are systematically addressed.

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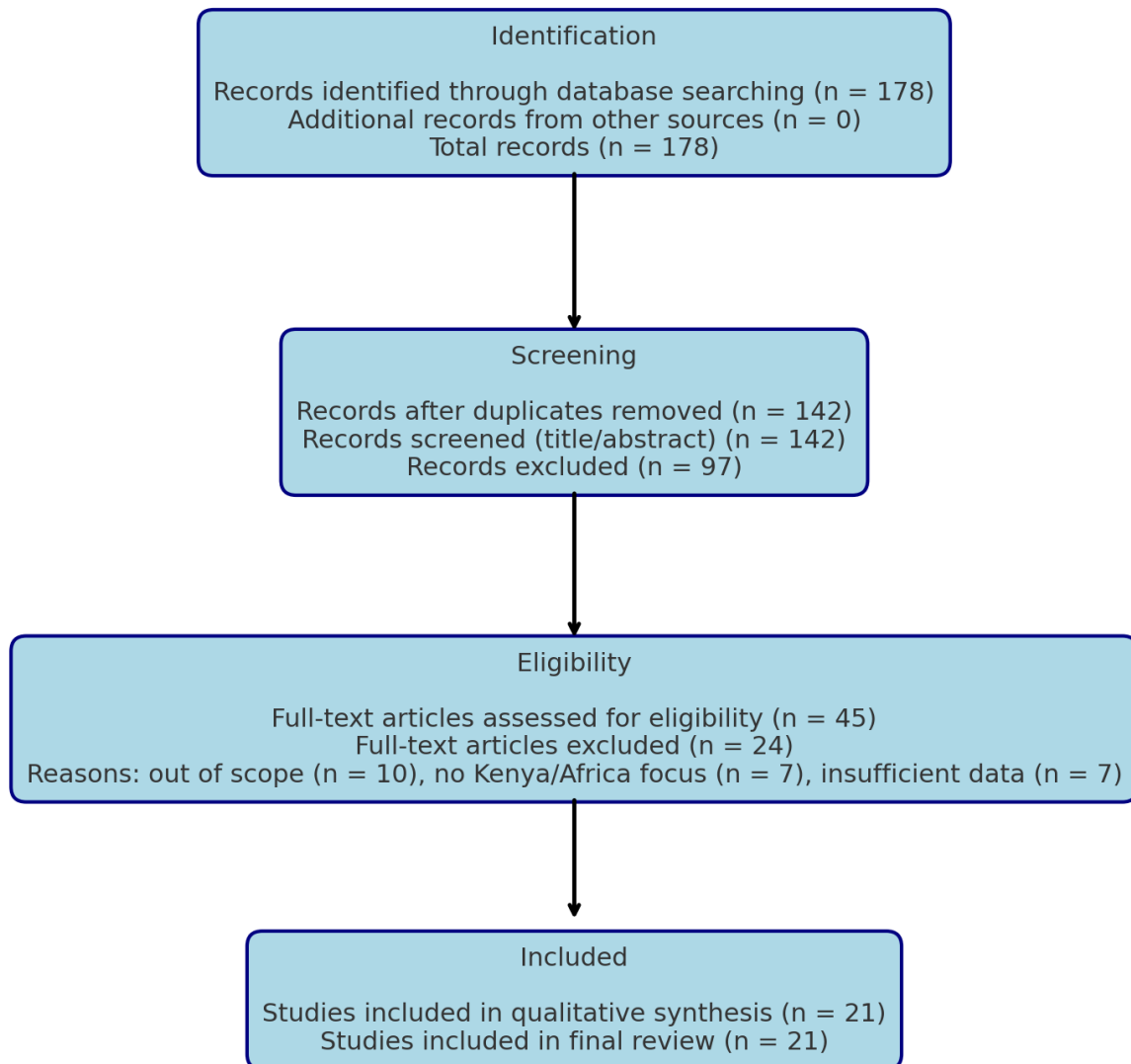
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APPENDIX A:

PRISMA Flow Diagram (matched to Methodology counts)



APPENDIX B: PRISMA FLOW DATA EXTRACTION TABLE

Author(s)	Year	Country/Scope	Study Type/Method	Green Bond Focus	Renewable Energy Link	Key Variables Analysed	Major Findings	Opportunities	Challenges	Source/Link
Capital Markets Authority (Kenya)	2019	Kenya	Regulatory guidance (policy note)	Policy Guidance Note (PGN) for Green Bonds	RE & EE listed among eligible use-of-proceeds	Disclosure, external review, allocation & impact reporting	PGN formalises issuance, verification and reporting for Kenya's GB market aligned with international practice.	Credibility via mandatory independent verification; clearer issuer roadmap	Issuer compliance costs; capacity of verifiers	https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Kenya-Policy-Guidance-Note-for-Green-Bonds-260219.pdf
Nairobi Securities Exchange (NSE)	2019	Kenya	Issuer guide (market guidance)	Kenya Green Bond Market Issuer's Guide	Eligibility & listing guidance covers RE/EE assets	Listing rules, taxonomy, disclosure process	Provides step-by-step listing guidance consistent with CMA PGN.	Simplifies process for domestic issuers; improves market readiness	Low issuer familiarity; need for capacity-building	https://www.nse.co.ke/wp-content/uploads/green-bonds-guide-14.08.19-2.pdf
Climate Bonds Initiative (CBI)	2019	Kenya	Certification record / case note	Acorn Holdings – first Climate Bonds Certified deal in Kenya	Indirect (green buildings reduce energy demand)	Certification, use-of-proceeds, issue size	KSh 4.3bn (≈USD 40m) certified GB closed; funds student housing with green building criteria.	Demonstration effect; enhances investor confidence	Sector concentration; limited secondary liquidity	https://www.climatebonds.net/certification/acorn-holdings
GuarantCo / PIDG	2020	Kenya	Deal note / press release	Partial credit guarantee to Acorn green bond	Indirect via EE outcomes in buildings	Guarantee, subscription, redemption outcome	Credit enhancement enabled successful placement; later redemption confirmed market viability.	Blended finance de-risks issuance; crowding-in institutional investors	Dependence on donor/MDB support for first deals	https://guarantco.com/news/the-nairobi-securities-exchange-welcomes-its-first-green-bond-issue-acorn-holdings-guaranteed-by-guarantco-that-will-finance-clean-safe-affordable-and-green-certified-accommodation-for-5000-stud/

Author(s)	Year	Country/Scope	Study Type/Method	Green Bond Focus	Renewable Energy Link	Key Variables Analysed	Major Findings	Opportunities	Challenges	Source/Link
Energy & Petroleum Regulatory Authority (EPRA)	2024	Kenya	Official statistics report	Sector context for investment needs	Kenya's electricity mix dominated by renewables	Generation shares, capacity, subsector performance	FY2023/24 statistics confirm high RE share; pipeline requires substantial capital.	Strong baseline for GB-funded RE projects	Grid expansion/integration; project preparation	https://www.epra.go.ke/sites/default/files/2024-10/EPRA%20Energy%20and%20Petroleum%20Statistics%20Report%20FY%202023-2024_2.pdf
International Energy Agency (IEA)	2024	Kenya	Country analysis	Financing context for clean power	Nearly 90% of generation from renewables incl. geothermal	RE generation mix, targets	Kenya targets 100% RE electricity and universal access by 2030; geothermal is key.	Strong pipeline for RE bond financing	System integration and transmission upgrades	https://www.iea.org/reports/kenya-2024/executive-summary
Climate Policy Initiative (CPI)	2021	Kenya	Finance landscape study	Instrument mapping incl. bonds	Mitigation finance incl. RE segments	Annual climate flows, sources, instruments	Kenya mobilised ~USD 2.4bn climate finance (2018/19); large gap to needs remains.	Identifies gaps where GBs can scale	Fragmented data; pipeline development	https://www.climatepoliciyinitiative.org/wp-content/uploads/2021/03/The-Landscape-of-Climate-Finance-in-Kenya.pdf
NewClimate Institute (SNAPFI)	2021	Kenya	Policy/TA assessment	Support to Kenya's GB market development	RE among priority eligible categories	Policy sequencing, supervision, capacity needs	2019 PGN pivotal; further capacity & TA needed for scaling issuances.	Strengthen supervisory capacity; pipeline development	Verification capacity; issuer readiness	https://newclimate.org/sites/default/files/2021/06/SNAPFI.-Transforming-Kenyas-Financial-Sector.pdf
Kenya Bankers Association / SBFN	2019	Kenya	Guidelines background document	Kenya Green Bond Guidelines – Background	RE explicitly in eligibility taxonomy	Taxonomy, reporting, impact indicators	Sets out examples of eligible assets and impact indicators for issuers.	Common language for market actors	Ensuring consistent application & MRV	https://data.sbfnetwork.org/sites/default/files/1060_Kenya_Green_Bond_Guidelines_Background_Doc_2019_KBA.pdf
FSD Africa & Dalberg	2025	Africa (incl. Kenya)	Market report	Market pathways & impact in Africa	RE a core use-of-proceeds in African deals	Issuance trends, investor base, impact pathways	Africa's GB market is emerging; deeper local participation is needed.	Regional pipeline development; capacity building	Shallow markets; FX risk; verification costs	https://fsdafrica.org/wp-content/uploads/2025/03/Green-Bond-Report_Final-report-20.03.2025.pdf

Author(s)	Year	Country/Scope	Study Type/Method	Green Bond Focus	Renewable Energy Link	Key Variables Analysed	Major Findings	Opportunities	Challenges	Source/Link
London Stock Exchange Group (LSEG)	2022	Africa	Policy/market brief	Developing the green bond market in Africa	RE highlighted as priority sector	Issuance trends, standards, case examples	Morocco, Kenya, Nigeria, South Africa are leading in Africa's GB development.	Use exchanges to anchor transparency & demand	Standards alignment; liquidity	https://www.lseg.com/content/dam/lseg/en_us/documents/media-centre/developing-the-green-bond-market-africa.pdf
Debt Management Office (Nigeria)	2019	Nigeria	Press release (sovereign)	FGN Green Bond Series II	UoP included RE, transport, forestry	Subscription level, investor demand	Series II achieved 220% subscription; strong investor appetite.	Sovereign benchmark catalyses market	Maintaining reporting cadence; pipeline continuity	https://dmo.gov.ng/news-and-events/circulars-releases/2819-press-release-on-fgn-green-bond-2018?format=html
City of Johannesburg / JSE	2014	South Africa (municipal)	Municipal case (press/news)	First JSE-listed municipal green bond	EE, transport, RE in project mix	Oversubscription, pricing, maturity	Auction 150% oversubscribed; first green bond listed on JSE.	Municipal leadership; market signaling	Early-stage labeling/verification issues	https://www.joburg.org.za/media/MediaStatements/Pages/2014%20Press%20Releases/04-06-2014-The-City-of-Johannesburg-issues-the-first-ever-JSE-listed-Green-Bond.aspx
City of Cape Town / CCFLA	2017	South Africa (municipal)	Case study	Municipal GB for water & infrastructure	Financed EE, transport; complements RE	Oversubscription, use-of-proceeds, segment listing	First on JSE Green Bond Segment; oversubscribed 4x.	Strong demand for city bonds; replicability	Project selection & MRV capacity	https://citiesclimatefinance.org/financial-instruments/cases/green-bond-for-infrastructure-financing-in-cape-town-south-africa
World Bank	2022	Egypt (sovereign)	Case study	First MENA sovereign green bond	Clean transport & water; part of RE ecosystem	Allocation, impact, assurance	Clear framework and reporting catalysed investor demand; replicable for EM sovereigns.	Benchmarking for region; policy signaling	Building internal reporting systems	https://thedocs.worldbank.org/en/doc/931e017a795e984d79cfcaccadac563f-0340012022/original/16341-WB-Egypt-Case-Study-WEB.pdf

Author(s)	Year	Country/Scope	Study Type/Method	Green Bond Focus	Renewable Energy Link	Key Variables Analysed	Major Findings	Opportunities	Challenges	Source/Link
Egypt Ministry of Finance / V.E (Moody's)	2021	Egypt	Allocation & Impact Report + independent assurance	Sovereign GB proceeds allocation & impact	Allocations to clean transport & sustainable water; RE share in portfolio varies	Use-of-proceeds, % allocated, impact KPIs, assurance conclusion	75% of net proceeds allocated; reasonable assurance provided on alignment.	Transparency builds investor trust	Ongoing data collection burden	https://mof.gov.eg/files/a3362b50-574c-11ec-9145-6f33c8bd6a26.pdf
IFC–Amundi	2021	Emerging markets	Market report	EM green bond issuance & investor base	RE is core UoP across EM GBs	Issuance volumes, investor mix, pricing snapshots	EM GB issuance expanded strongly; sovereigns and corporates both active.	EM demand momentum; potential cost advantages	FX & liquidity risks; data quality	https://www.ifc.org/content/dam/ifc/doc/mgrt/202206-emerging-market-green-bonds-report-2021-vf-2.pdf
Climate Bonds Initiative (CBI)	2024	Global	Global state-of-market report	GSS+ market size & structure (to end-2023)	RE consistently among largest UoP categories	Cumulative volumes, label mix, sovereign trends	By end-2023, aligned GSS+ cumulative volume ≈ USD 4.4tn; green remains largest segment.	Deepening investor base; benchmarks for issuers	Methodology rigor; market cyclicity	https://www.climatebonds.net/files/documents/publications/Global-State-of-the-Market-Report-2023.pdf
Climate Bonds Initiative (CBI)	2023	Global (Q3 update)	Market summary	GSS+ volumes through Q3-2023	RE significant in aligned issuance	Cumulative and YTD issuance, sovereign counts	Cumulative aligned GSS+ at USD 4.2tn by Q3-2023; 49 sovereigns had issued.	Robust sovereign segment; templates for EMs	Volatility in quarterly issuance	https://www.climatebonds.net/files/documents/publications/State-of-the-Market-Q3-2023.pdf
Flammer, C.	2021	Global (corporates)	Quantitative (event study)	Corporate green bond issuance effects	RE among financed projects	Announcement returns, environmental performance, certification	Positive stock reaction and improved environmental outcomes, stronger with certification.	Reputational gains; lower capital costs	Ensuring credibility; avoiding greenwashing	https://www.columbia.edu/~cf2870/PDFs/Corporate-Green-Bonds_Flammer_JFE2021.pdf
Zerbib, O.D.	2019	Global	Econometric (matching + regression)	Green bond pricing ('greenium')	Many RE-linked bonds in sample	Yield spreads vs matched conventional bonds	Small negative premium ('greenium') on yields observed on average.	Potential issuer cost savings	Heterogeneity by issuer type and credibility	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2889690

Author(s)	Year	Countr y/Scope	Study Type/ Method	Green Bond Focus	Renewable Energy Link	Key Variables Analysed	Major Findings	Opportunities	Challenges	Source/Link
Ehlers, T. & Packer, F. (BIS)	2017	Global	Policy/ma rket analysis	Certification & standards	RE is principal eligible category	Labeling, verification models, market integrity	Certification improves integrity and investor confidence in GBs.	Standardisation benefits; scaling with credible labels	Verification costs; capacity in EMs	https://www.bis.org/publ/qtrpdf/r_qt1709h.htm

APPENDIX C: QUALITY ASSESSMENT TABLE (CASP/JBI-ADAPTED)

This table summarizes the quality appraisal for the 21 included studies using adapted CASP/JBI criteria, considering evidence class, methodological transparency, triangulation, risk of bias, and relevance to the research question.

Author(s)	Year	Country/Scope	Study Type/Method	Evidence Class	Method Transparency	Data Triangulation	Risk of Bias	Relevance to RQ	Overall Quality	Notes
Capital Markets Authority (Kenya)	2019	Kenya	Regulatory guidance (policy note)	Regulatory/Guidance	Moderate	Partial	Medium- Low	High	Moderate- High	Sets market rules; high policy relevance, not empirical impact evidence.
Nairobi Securities Exchange (NSE)	2019	Kenya	Issuer guide (market guidance)	Regulatory/Guidance	Moderate	Partial	Medium- Low	High	Moderate- High	Sets market rules; high policy relevance, not empirical impact evidence.
Climate Bonds Initiative	2019	Kenya	Certification record / case note	Market data/report	Moderate- High	Yes	Low- Medium	High	Moderate- High	Widely used market statistics; methodology

Author(s)	Year	Country/Scope	Study Type/Method	Evidence Class	Method Transparency	Data Triangulation	Risk of Bias	Relevance to RQ	Overall Quality	Notes
(CBI) – Acorn Certification										described; some definitional variance.
GuarantCo / PIDG	2020	Kenya	Deal note / press release	Press/Deal documentation	Moderate	No	Medium	High	Moderate	Primary record of issuance; factual but limited analytical depth.
Energy & Petroleum Regulatory Authority (EPRA)	2024	Kenya	Official statistics report	Official statistics / Country analysis	High	Yes	Low	High	High	Authoritative datasets with transparent methodology.
International Energy Agency (IEA)	2024	Kenya	Country analysis	Official statistics / Country analysis	High	Yes	Low	High	High	Authoritative datasets with transparent methodology.
Climate Policy Initiative (CPI)	2021	Kenya	Finance landscape study	Institutional/Policy	Moderate	Partial	Medium	High	Moderate	Policy-focused; relies on secondary evidence.
New Climate Institute (SNAPFI)	2021	Kenya	Policy/TA assessment	Institutional/Case study	Moderate-High	Partial-Yes	Medium-Low	High	Moderate-High	IFI/industry analysis; triangulated sources; limited peer review.
Kenya Bankers Association / SBFN	2019	Kenya	Guidelines background document	Regulatory/Guidance	Moderate	Partial	Medium-Low	High	Moderate-High	Sets market rules; high policy relevance, not empirical

Author(s)	Year	Country/Scope	Study Type/Method	Evidence Class	Method Transparency	Data Triangulation	Risk of Bias	Relevance to RQ	Overall Quality	Notes
										impact evidence.
FSD Africa & Dalberg	2025	Africa (incl. Kenya)	Market report	Market data/report	Moderate-High	Yes	Low-Medium	High	Moderate-High	Widely used market statistics; methodology described; some definitional variance.
London Stock Exchange Group (LSEG)	2022	Africa	Policy/market brief	Institutional/Policy	Moderate	Partial	Medium	High	Moderate	Policy-focused; relies on secondary evidence.
Debt Management Office (Nigeria)	2019	Nigeria	Press release (sovereign)	Press/Deal documentation	Moderate	No	Medium	High	Moderate	Primary record of issuance; factual but limited analytical depth.
City of Johannesburg / JSE	2014	South Africa (municipal)	Municipal case (press/news)	Press/Deal documentation	Moderate	No	Medium	High	Moderate	Primary record of issuance; factual but limited analytical depth.
City of Cape Town / CCFLA	2017	South Africa (municipal)	Case study	Institutional/Case study	Moderate-High	Partial-Yes	Medium-Low	High	Moderate-High	IFI/industry analysis; triangulated sources; limited peer review.

Author(s)	Year	Country/Scope	Study Type/Method	Evidence Class	Method Transparency	Data Triangulation	Risk of Bias	Relevance to RQ	Overall Quality	Notes
World Bank (Egypt case)	2022	Egypt (sovereign)	Case study	Institutional/Case study	Moderate-High	Partial-Yes	Medium-Low	High	Moderate-High	IFI/industry analysis; triangulated sources; limited peer review.
Egypt Ministry of Finance / V.E (Moody's)	2021	Egypt	Allocation & Impact Report + independent assurance	Institutional/Policy	Moderate	Partial	Medium	High	Moderate	Policy-focused; relies on secondary evidence.
IFC–Amundi	2021	Emerging markets	Market report	Market data/report	Moderate-High	Yes	Low-Medium	High	Moderate-High	Widely used market statistics; methodology described; some definitional variance.
Climate Bonds Initiative (CBI) – Global State of the Market 2023	2024	Global	Global state-of-market report	Market data/report	Moderate-High	Yes	Low-Medium	High	Moderate-High	Widely used market statistics; methodology described; some definitional variance.
Climate Bonds Initiative (CBI) – Q3 2023 Update	2023	Global (Q3 update)	Market summary	Market data/report	Moderate-High	Yes	Low-Medium	High	Moderate-High	Widely used market statistics; methodology described; some definitional variance.

Author(s)	Year	Country/Scope	Study Type/Method	Evidence Class	Method Transparency	Data Triangulation	Risk of Bias	Relevance to RQ	Overall Quality	Notes
Flammer, C.	2021	Global (corporates)	Quantitative (event study)	Peer-reviewed empirical	High	Yes	Low	High	High	Peer-reviewed empirical design; strong internal validity.
Zerbib, O.D.	2019	Global	Econometric (matching + regression)	Peer-reviewed empirical	High	Yes	Low	High	High	Peer-reviewed empirical design; strong internal validity.

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