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Community-Driven FinTech Models for Sustainable Development in Western Kenya

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Abstract: *This study explores the contribution of community-driven financial technology (Fin- Tech) models to sustainable development in Western Kenya, a region where rural entrepreneurs face persistent barriers to financial access. Weak infrastructure, limited credit opportunities, and low digital literacy have restricted growth, deepened inequality, and slowed progress toward inclusive development. Anchored in the Sustainable Development Goals poverty re- duction (SDG 1), decent work and economic growth (SDG 8), and innovation and infrastructure (SDG 9) the research investigates how localized financial innovations can enhance resilience and opportunity. A mixed methods design was employed. Surveys were conducted with 200 entrepreneurs, alongside 20 interviews with community financial leaders, and a review of six technology-enabled finance initiatives. Qualitative data were analyzed thematically using NVivo, while quantitative results were processed in SPSS to identify trends and patterns. The findings show that mobile-accessible platforms remain the most preferred financing option in Western Kenya, especially those that do not rely on collateral. Nonetheless, persistent challenges include low trust in formal financial institutions and limited digital literacy. The study concludes that localized FinTech solutions—such as digital savings groups, USSD-based microfinance systems, and credit-scoring innovations hold significant potential for promoting inclusion and resilience in the region. It recommends stronger public–private collaboration, targeted digital literacy programs, and the creation of county-level FinTech hubs to scale innovation, strengthen entrepreneurship, and align community finance with sustainable development goals.*

Keywords: *FinTech, Inclusion, Sustainability, Development, Innovation, Entrepreneurship, Kenya*

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1. Introduction

The Sustainable Development Goals (SDGs), adopted by the United Nations in 2015, provide a global blueprint for tackling poverty, inequality, and climate change while fostering inclusive economic growth (United Nations, 2015). Of the seventeen goals, SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure) are particularly central to Africa's transformation agenda. These goals align with the African Union's Agenda 2063, which envisions shared prosperity, integration, and inclusive growth across the continent (African Union Commission, 2015). Yet, despite this alignment, many regions in sub-Saharan Africa remain on the margins of sustainable development. Western Kenya shines a searchlight on this challenge. Counties such as Bungoma, Kakamega, Vihiga, Busia, and Kisumu face persistent financial and structural barriers that undermine entrepreneurship and deepen rural–urban disparities. Limited access to credit, weak financial infrastructure, and low digital literacy continue to constrain enterprise development, particularly among women, youth, and smallholder farmers who form the backbone of the region's informal economy (Lashitew et al., 2019; Suri and Jack, 2021). These challenges expose the vulnerability of local communities and highlight the urgent need for context-sensitive financial innovations.

Financial technology (FinTech) provides a promising pathway for addressing such gaps. Innovations such as mobile money, USSD-based platforms, peer-to-peer lending, blockchain solutions, and AI-driven credit scoring are disrupting traditional finance by reducing dependence on collateral and extending services to previously excluded populations (Almaqtari, 2024; Atayah et al., 2023). Beyond inclusion, FinTech is increasingly tied to environmental sustain- ability through green finance initiatives that reward eco-friendly practices, track carbon use, and promote climate-conscious investments (Cristina et al., 2021; Yao et al., 2021). However, while these tools are gaining traction globally, their adoption in rural Africa and especially in Western Kenya remains slow due to infrastructural weaknesses, regulatory uncertainty, and deep-seated mistrust of formal institutions (Najaf et al., 2021).

Kenya is often celebrated as a global leader in digital finance through innovations such as M-Pesa, and national frameworks such as Vision 2030 and the Digital Economy Blueprint emphasize the centrality of technology in driving inclusion (Government of Kenya, 2007; Min- istry of ICT, Innovation and Youth Affairs, 2019). Yet, Western Kenya continues to lag behind. Entrepreneurs in this region struggle with fragmented regulation, limited digital literacy, and inadequate access to affordable credit. Existing research has largely examined FinTech at the national level, with limited attention to subnational realities, community-driven adoption pat- terns, and the integration of environmental sustainability in rural contexts (Buckley et al., 2019; Udeagha and Breitenbach, 2023). This gap creates a mismatch between Kenya's digital finance narrative and the lived experiences of entrepreneurs in marginalized counties.

This study seeks to address that gap by examining how FinTech and green finance can be harnessed to promote sustainable development in Western Kenya. By blending a systematic literature review with empirical case evidence, it aims to identify scalable, community-driven financial innovations that can strengthen financial inclusion, spur economic growth, and embed environmental sustainability in line with the SDGs, Kenya's Vision 2030, and Agenda 2063.

Research Objectives General Objective

To examine the role of Financial Technology (FinTech) in promoting sustainable development— financially, economically, and environmentally—in Western Kenya.

Specific Objectives

1. To assess the impact of FinTech adoption on financial inclusion in selected counties of Western Kenya.
2. To evaluate the influence of FinTech-enabled services on economic growth and household income levels in Western Kenya.
3. To analyze the contribution of FinTech innovations to environmental sustainability and green finance uptake in Western Kenya.

2. Literature Review

Financial Technology (FinTech) has emerged as a transformative force in global finance, with significant implications for sustainable development. It facilitates financial inclusion, supports economic growth, and increasingly integrates environmental sustainability through digital in- novations. This review is organized into four themes: financial inclusion, regulation and insti- tutional capacity, environmental sustainability, and risks and ethical considerations.

2.1 FinTech and Financial Inclusion

FinTech tools such as mobile money, blockchain, peer-to-peer lending, and AI-driven credit scoring are widely recognized for their ability to expand financial inclusion in underserved regions. In Kenya, mobile platforms like M-Pesa have enabled access to credit, savings, and insurance among marginalized groups, including women and youth (Lashitew et al., 2019; Kim, 2022). Similarly, Cristina et al. (2021) highlight how FinTech platforms integrate environmental and social performance metrics, thereby linking financial inclusion with sustainability.

While such findings underscore the potential of digital finance, the effectiveness of these tools is highly dependent on local conditions. In rural counties such as Vihiga and Busia, low digital literacy and limited internet access remain major obstacles. These insights suggest that *simpler technologies*—such as USSD-based platforms that operate without smartphones—may be more appropriate. However, many studies emphasize success stories without addressing these barriers, leaving a gap in understanding how digital exclusion shapes adoption at the grassroots.

2.2 Regulation, Trust, and Institutional Capacity

The growth of FinTech is also shaped by regulation and institutional governance. Rambaud and Gázquez (2022) caution that overly strict data privacy laws, such as the GDPR, may stifle innovation, while Almaqtari (2024) finds that strong digital governance enables sustainable FinTech ecosystems. These perspectives suggest that regulation must strike a balance between protection and innovation.

In the Kenyan context, county-level dynamics remain underexplored. Although local SACCOs and community banks in Kisumu and Kakamega demonstrate some success in deploying inclusive finance, studies rarely investigate how institutional capacity at the subnational level shapes FinTech outcomes. Furthermore, cybersecurity risks, as noted by Najaf et al. (2021), re- main under-addressed in rural contexts where digital fraud and mistrust of formal institutions already discourage participation. This reveals a critical gap: *FinTech adoption cannot be under- stood in isolation from trust, security, and governance structures, particularly in fragile local economies.*

2.3 Green Finance and Environmental Innovation

Environmental sustainability represents an emerging, though less developed, strand of FinTech research. Yang et al. (2021) and Yao et al. (2021) describe innovations such as carbon foot- print tracking, green bonds, and eco-investment apps, while Kabaklarlı (2022) applies the En- vironmental Kuznets Curve to show that FinTech's ecological benefits often appear only after regulatory maturity.

Although these global studies demonstrate promising models, their relevance to rural Africa remains uncertain. In Western Kenya, pilot projects linking digital finance with solar lending or clean energy adoption have shown early promise (Udeagha and Breitenbach, 2023). Yet, most studies fail to assess how such innovations can be scaled in low-income, agrarian contexts. As a result, the environmental dimension of FinTech remains underexplored, with limited integration into Kenya's rural development agenda.

2.4 Risks, Gaps, and Ethical Considerations

Despite FinTech's promise, risks such as over-indebtedness, predatory lending, and digital mis-information are increasingly evident. Atayah et al. (2023) caution that investor skepticism about ESG disclosures undermines financial performance, while Liu et al. (2021) argue that digital finance can exacerbate inequality if not paired with inclusion strategies. In Western Kenya, mobile loan defaults and misuse of digital credit services are becoming common, particularly among older and low-literacy populations.

These risks underscore the need for targeted financial education, stronger consumer protection, and ethical design principles. However, much of the existing literature treats these risks as secondary, rather than integral, to FinTech adoption. The gap lies in contextual studies that interrogate how ethical and regulatory safeguards can be localized to rural African markets.

2.5 Synthesis and Identified Gaps

Across these themes, three insights emerge. First, FinTech clearly enhances financial inclusion and economic activity, but its success is uneven where digital literacy is low. Second, regulation and trust are central to adoption, yet few studies consider the institutional realities of counties and local cooperatives in Kenya. Third, while FinTech's environmental role is widely discussed globally, it remains under-integrated in rural Africa, including Western Kenya.

In sum, most existing research is national or global in scope, descriptive in nature, and silent on subnational realities. Little is known about how FinTech functions in marginalized counties, how community-driven models evolve in informal economies, or how environmental sustainability can be embedded at the local level. This study addresses these gaps by focusing explicitly on Western Kenya, employing both systematic literature review and empirical analysis to uncover scalable, inclusive, and context-sensitive FinTech solutions.

3. Methodology

This study adopted a mixed-methods research design that integrated a systematic literature re- view, bibliometric analysis, and an empirical component comprising a survey and key informant interviews. The use of multiple methods enabled triangulation of evidence and enhanced the robustness of the findings across three dimensions of sustainable development, namely financial inclusion, economic growth, and environmental sustainability in Western Kenya.

3.1 Study Area and Scope

The study was conducted in five counties in Western Kenya, namely Bungoma, Kakamega, Vihiga, Kisumu, and Busia. These counties were purposively selected due to their emerging entrepreneurial activity, differing levels of infrastructural development, and increasing visibility of digital financial services. The variation in rural–urban characteristics across the counties provided an appropriate setting for examining community-driven FinTech adoption and its im- plications for sustainable development.

3.2 Systematic Literature Review

A systematic literature review was conducted in

accordance with the PRISMA 2020 guidelines to ensure transparency, rigor, and replicability. The review was based on peer-reviewed studies retrieved from the Web of Science database and covered publications from 2015 to 2024. The search strategy employed keywords related to FinTech, digital finance, mobile money, green finance, and financial inclusion.

The initial database search yielded 1,947 records. Following title and abstract screening, 371 studies were retained for further assessment. Full-text screening resulted in 157 articles, out of which 121 empirical studies met the final inclusion criteria and were incorporated into the review. A summary of the literature selection process is presented in Table 1.

Table 1: PRISMA Summary of Literature Selection

Step	Records
Initial records retrieved	1,947
After title/abstract screening	371
After full-text review	157
Empirical studies included	121

Studies were included in the review if they were peer-reviewed empirical publications within the 2015–2024 period, written in English, and explicitly focused on FinTech and sustain- ability using qualitative, quantitative, or mixed-methods approaches. Studies were excluded if they were conceptual or opinion-based, classified as grey literature such as government or NGO reports, published in languages other than English, or deemed misclassified or irrelevant to the objectives of the study. The inclusion and exclusion criteria are summarized in Table 2.

Table 2: Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Peer-reviewed empirical studies (2015–2024)	Opinion or conceptual papers
Focus on FinTech and sustainability	Grey literature (NGO/government reports)
English language publications	Non-English publications
Studies using qualitative, quantitative, or mixed methods	Misclassified or irrelevant studies

The selected studies were systematically coded and analyzed thematically using NVivo software, while Excel spreadsheets were used to organize and manage the extracted data for comparative analysis.

3.3 Bibliometric Mapping

Bibliometric analysis was conducted to complement the systematic literature review and to identify intellectual structures and emerging research trends within the FinTech and sustainability literature. The analysis was undertaken using VOSviewer and the bibliometrix package in R Studio. VOSviewer was employed to generate keyword co-occurrence and co-citation networks, while bibliometrix was used to produce trend analyses, word clouds, and thematic clustering of the reviewed studies. The bibliometric outputs highlighted key research hotspots, including digital credit, financial resilience, green finance, and FinTech adoption, which informed the interpretation of both the empirical findings and the thematic synthesis of the literature.

3.4 County-Level Mapping

County-level mapping was undertaken to capture spatial variations in FinTech adoption and application across Western Kenya. Based on the reviewed literature, counties were systematically coded according to their socioeconomic profiles, frequency of representation in published studies, and dominant FinTech applications. This classification enabled a comparative assessment of how contextual factors shape FinTech use at the local level. A summary of county representation and associated FinTech applications is presented in Table 3.

Table 3: County Representation in Reviewed Literature

County	Profile	Article Count	Key FinTech Applications
Bungoma	Agrarian/rural	3	Chamas, mobile credit, SACCOs
Kakamega	Rural-urban hybrid	3	Youth savings platforms
Vihiga	Low-income, rural	3	Women's inclusion, literacy campaigns
Kisumu	Urbanizing	4	Green lending, digital entrepreneurship
Busia	Cross-border trade	3	USSD mobile payments, informal finance

The county-level mapping informed the design of the empirical instruments by ensuring that survey questions and interview guides were sensitive to county-specific characteristics, thereby enhancing the contextual relevance and analytical depth of the empirical component.

3.5 Empirical Component

The empirical component of the study consisted of a cross-sectional survey and key informant interviews conducted across the five selected counties in Western Kenya.

3.5.1 Sampling

The survey targeted a total of 200 entrepreneurs, with approximately 40 respondents drawn from each county. Respondents were selected using a stratified sampling approach to ensure adequate representation across gender, economic sector, and rural–urban location. The sectors covered included agriculture, trade, and services, reflecting the dominant livelihood activities within the study area.

In addition, twenty key informant interviews were conducted with purposively selected participants drawn from relevant financial and institutional stakeholders. These included SACCO managers, chama leaders, digital lenders, and county finance officers, whose roles provided institutional and policy-level perspectives on FinTech adoption and community-based financial practices.

3.5.2 Data Collection

Data were collected using both quantitative and qualitative instruments. The survey data were gathered through a structured questionnaire designed to capture respondents' demographic characteristics, patterns of FinTech usage, perceived income effects, and sustainability-related practices. The questionnaire was administered to entrepreneurs across the selected counties using trained research assistants.

Qualitative data were obtained through semi-structured key informant interviews guided by an interview schedule that explored institutional perspectives on FinTech adoption, perceived barriers to implementation, and emerging opportunities for community-based financial innovation.

Prior to the main data collection exercise, the survey instrument was pilot tested with 20 respondents drawn from areas outside the main study sample. The pilot study enabled refinement of the questionnaire and assessment of internal consistency, with Cronbach's alpha values meeting the acceptable reliability threshold of 0.70.

3.6 Data Analysis

Quantitative data were analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistical techniques, including means, frequencies, and cross-tabulations, were employed to summarize respondent characteristics and patterns of FinTech usage. Internal consistency of the survey instruments was assessed using Cronbach's alpha.

Inferential analysis was conducted to examine the relationships between FinTech adoption and the study's key outcome variables. Regression analysis was used to assess the influence of FinTech adoption on financial inclusion, while income-based regression models examined its effects on economic growth. Logistic regression analysis was applied to evaluate the association between FinTech adoption and environmental sustainability outcomes.

Qualitative data obtained from key informant interviews were analyzed using NVivo software. The analysis involved open and axial coding of interview transcripts, followed by thematic synthesis to identify recurring patterns and insights. Inter-coder reliability was assessed and met the acceptable threshold of 0.70. The qualitative findings were integrated with the survey results and evidence from the systematic literature review.

In addition, bibliometric outputs were triangulated with the empirical findings to enhance the robustness and validity of the overall analysis.

3.7 Reliability and Validity

Reliability of the quantitative instruments was assessed using Cronbach's alpha to determine internal consistency of the survey scales, with all values meeting acceptable thresholds. For the qualitative component, inter-coder reliability checks were conducted to ensure consistency in the coding and interpretation of interview data.

Validity was addressed through factor analysis of composite survey scales to confirm construct validity. In addition, methodological triangulation across the systematic literature review, bibliometric analysis, survey data, and key informant interviews enhanced internal validity and strengthened the credibility of the study findings.

3.8 Ethical Considerations and Research Governance

Ethical approval for the study was obtained from the Masinde Muliro University Research Ethics Committee prior to data collection. All participants were provided with detailed in- formation about the study objectives and procedures, and informed consent was obtained in written or verbal form before participation. Participation was voluntary, and respondents were assured that they could withdraw from the study at any stage without any risk of harm or financial obligation.

To ensure confidentiality, all data were anonymized and interview responses were re- ported using pseudonyms, such as "KII-4, Kakamega, SACCO manager." Digital data were securely stored on password-protected devices accessible only to the research team. Measures were also taken to ensure data integrity and responsible handling throughout the research process.

In terms of research governance, a preliminary version of this manuscript was peer- reviewed and presented at the 8th Multidisciplinary Conference of Gretsa University in 2025. Feedback received from academics and practitioners during the conference was incorporated into the final version of the manuscript, thereby strengthening its scholarly rigor and relevance.

3.9 Limitations

Despite the methodological rigor employed, the study has several limitations. First, the system- atic literature review was limited to English-language publications, which may have introduced language bias and excluded relevant studies published in other languages. Second, the exclusion of grey literature, such as policy documents and institutional reports, limits the direct applica- bility of some findings to policy formulation. Finally, the cross-sectional nature of the empirical data restricts causal inference, and future studies may benefit from longitudinal designs to better capture dynamic effects of FinTech adoption over time.

4. Results and Discussion

Findings are presented and discussed thematically, reflecting the three domains of sustainable development: financial inclusion, economic development, and environmental sustainability. County-specific variations and cross-cutting implications are integrated to ensure contextual relevance.

4.1 Financial Inclusion

Financial inclusion emerged as the most prominent theme, represented in 31 of the 121 reviewed studies (25.6%). Mobile money platforms, particularly M-Pesa, were identified as critical enablers of digital savings, mobile-based loans, and informal group finance such as chamas. USSD platforms were especially relevant for users without smartphones, enabling last-mile access.

Empirical evidence from Bungoma and Vihiga highlighted women-led digital savings groups that strengthened microenterprise resilience. However, uptake was uneven, with barriers including limited digital literacy, mistrust of formal providers, and data privacy concerns. These findings confirm Lashitew et al. (2019) and Kim (2022), who emphasize mobile finance as transformative yet constrained by literacy and trust gaps.

The bibliometric analysis reinforced this by clustering keywords such as *mobile money*, *digital literacy*, and *chamas*. These results suggest that while inclusion has improved, sustain- able integration requires capacity building and consumer protection—a point underemphasized in much of the global literature.

4.2 Economic Development

Economic outcomes were addressed in 30 studies (24.8%), highlighting how FinTech tools contribute to income growth, job creation, and enterprise resilience. Peer-to-peer lending, blockchain-enabled supply chains, and digital credit scoring supported youth entrepreneurship in Kakamega and cross-border traders in Busia. Bungoma showed evidence of improved

household resilience where flexible repayment loans were accessible.

However, risks of over-reliance on short-term credit and rising loan defaults were re- ported, echoing concerns raised by Liu et al. (2021) about financial vulnerability. Several studies flagged predatory lending practices, suggesting that FinTech can both empower and endanger entrepreneurs if not paired with financial literacy.

The county-level differences show that while Busia benefits from trade-driven FinTech adoption, rural counties such as Vihiga lag due to structural poverty and digital exclusion. This supports the argument by Buckley et al. (2019) that FinTech's benefits are context-dependent and uneven without institutional safeguards.

4.3 Environmental Sustainability

Only 21 studies (17.4%) are explicitly engaged with environmental sustainability, indicating a clear gap in green FinTech applications in rural Africa. Pilot initiatives in Kisumu and Vihiga linked digital finance to clean energy adoption, such as solar kits and efficient cookstoves. These were sometimes gamified, rewarding users for timely repayments or sustainable behavior.

Bibliometric outputs identified emerging but underdeveloped themes like *green bonds*, *ESG scoring*, and *carbon finance*. These findings align with Udeagha and Breitenbach (2023), who argue that Africa has yet to fully connect FinTech innovation with environmental policy. The limited presence of green finance tools in Western Kenya demonstrates both an opportunity and a policy gap.

4.4 County-Level Patterns

The five counties revealed distinct FinTech adoption profiles:

- **Bungoma:** strong in mobile chamas and SACCO-linked lending.
- **Kakamega:** active in youth-focused digital savings and entrepreneurship.
- **Vihiga:** emphasis on literacy training and women's inclusion.
- **Kisumu:** experimentation with green lending and digital entrepreneurship.
- **Busia:** focus on cross-border trade and USSD-based payments.

These variations highlight the need for county-specific strategies rather than one-size-fits-all models. Local institutional capacity, socio-economic structures, and user readiness shaped adoption trajectories.

4.5 Cross-Cutting Insights

Four key insights emerge across the thematic areas:

1. **Group-based FinTech models** (e.g., chamas) enhance resilience but require digital literacy support.
2. **Economic empowerment** is stronger when credit access is coupled with entrepreneurship training.
3. **Environmental sustainability** remains under-integrated, calling for deliberate policy–finance linkages.
4. **Trust and risk management tools** (e.g., digital ID verification, consumer protection frameworks) are critical for long-term adoption. These insights illustrate that FinTech in Western Kenya is not only about technology but about embedding financial services into community networks, building institutional trust, and aligning innovations with social and environmental priorities.

4.6 Summary

FinTech adoption in Western Kenya has significantly advanced financial inclusion and con- tributed to economic empowerment, though challenges persist in digital literacy, trust, and con- sumer protection. Environmental sustainability, while promising, remains the least developed pillar, requiring greater policy and institutional attention. County-level analysis reinforces the importance of localized, context-sensitive approaches, as adoption patterns vary widely.

5. Conclusion and Recommendations

5.1Conclusion

This study set out to examine the role of FinTech in promoting sustainable development in Western Kenya, focusing on three dimensions: financial inclusion, economic growth, and envi- ronmental sustainability. The findings reveal that FinTech has significantly expanded financial inclusion, especially through mobile money, digital savings groups, and USSD platforms that reach underserved populations. Economic development benefits are evident in improved house- hold resilience, entrepreneurial growth, and enhanced cross-border trade, though risks

such as over-indebtedness and predatory lending temper these gains. Environmental sustainability, while emerging, remains the least integrated pillar, with pilot initiatives in solar finance and green lending showing potential but limited scale.

A key insight is the county-level variation: Bungoma thrives on group-based lending, Kakamega on youth-focused savings, Vihiga on women's literacy-driven inclusion, Kisumu on green entrepreneurship, and Busia on trade-linked mobile payments. This underscores that Fin- Tech adoption in Western Kenya is context-dependent, shaped by socio-economic structures and institutional readiness rather than technology alone. Overall, the study concludes that Fin- Tech in Western Kenya is a double-edged tool: it has the power to transform livelihoods but also the potential to entrench vulnerability if left unregulated or poorly aligned with community realities.

5.2Recommendations

1. Policy Recommendations

(a) Strengthen regulatory frameworks to curb predatory lending and protect consumers from financial overexposure.

(b) Promote county-level FinTech strategies that tailor interventions to local socio-economic realities, avoiding one-size-fits-all models.

(c) Integrate green finance into FinTech innovations by incentivizing solar energy financing, clean cooking solutions, and digital carbon credit schemes.

2. Institutional Recommendations

(a) Expand digital literacy programs targeting women, rural populations, and youth to ensure equitable participation.

(b) Leverage group-based finance (chamas, SACCOs) by digitizing and securing them through blockchain or mobile platforms, while maintaining community trust.

(c) Partner with universities and innovation hubs to create FinTech incubators that align with local entrepreneurship and sustainability goals.

3. Research Recommendations

(a) Future research should adopt longitudinal designs to track the long-term effects of Fin- Tech adoption on households and enterprises.

(b) Comparative studies across counties and regions could illuminate structural differences in adoption patterns.

(c) Greater attention is needed on the intersection of FinTech and environmental sustainability, particularly green bonds, ESG scoring, and digital climate finance.

References

African Union Commission (2015). Agenda 2063: The Africa We Want. African Union, Addis Ababa.

Almaqtari, F. A. (2024). Digital governance and sustainable FinTech ecosystems: Evidence from emerging economies.*Journal of Sustainable Finance & Investment*, *14*(2):245–262.

Atayah, O. F., Al-Shboul, M., Moh'd, A. A., and Abdulaziz, A. (2023). ESG disclosure and firm performance: Investor perceptions in FinTech markets. *Journal of Business Ethics*, *184*(1):1–19.

Buckley, R. P., Arner, D. W., Zetzsche, D. A., and Selga, E. (2019). Building inclusive digital finance: The role of regulation. *Journal of Banking Regulation*, *20*(1):1–14.

Cristina, M., Mart´ınez, C., and López, R. (2021). FinTech, sustainability, and financial inclusion: Emerging evidence from digital platforms. *Sustainability*, 13(18):10116.

Government of Kenya (2007). *Kenya Vision 2030*. Government Printer, Nairobi.

Kabaklarlı, E. (2022). FinTech development, environmental sustainability, and the environmental Kuznets curve. *Environmental Science and Pollution Research*, *29*(35):53145–53158.

Kim, Y. (2022). Digital financial inclusion and its impact on households in sub-Saharan Africa. *World Development*, 157:105931.

Lashitew, A. A., Van Tulder, R., and Liasse, Y. (2019). Mobile phones for financial inclusion: What explains the diffusion of mobile money innovations? *Research Policy*, *48*(5):1201–1215.

Liu, Y., Ozili, P. K., and Ghosh, S. (2021). Digital finance, financial inclusion, and inclusive growth: International evidence. *Emerging Markets Finance and Trade*, *57*(3):1–18.

Ministry of ICT, Innovation and Youth Affairs (2019).

Digital Economy Blueprint: Powering Kenya's Transformation. Government Printer, Nairobi.

Najaf, K., Junaid, M., and Rehman, S. (2021). Cybersecurity risks and FinTech adoption in emerging markets. *Technological Forecasting and Social Change*, 166:120593.

Rambaud, S. C. and Gázquez, J. L. (2022). Data protection regulation and financial innovation: Lessons from GDPR. *Finance Research Letters*, 45:102336.

Suri, T. and Jack, W. (2021). The long-run poverty and gender impacts of mobile money. *Science*, *354*(6317):1288–1292.

Udeagha, M. C. and Breitenbach, M. C. (2023). Financial development and environmental sustainability in Africa: The moderating role of FinTech. *Journal of Cleaner Production*, 393:136337.

United Nations (2015). *Transforming our World: The 2030 Agenda for Sustainable Development*. UN Publishing, New York.

Yang, Y., Wang, Y., and Hu, J. (2021). FinTech innovation and green finance development. *Energy Economics*, 101:105427.

Yao, S., Wang, Y., and Hu, J. (2021). Digital finance, environmental regulation, and sustainable development. *Journal of Environmental Management*, 294:112985.