British Journal of Multidisciplinary and Advanced Studies,7(2),1-14, 2026

Economics and Finance

Print ISSN: 2517-276X

Online ISSN: 2517-2778

https://bjmas.org/index.php/bjmas/index

Publication of the European Centre for Research Training and Development -UK

Barriers to Scaling Circular Economy Practices in Selected Nigerian Cities

Kelechi Adaugo Vanessa Chukwueke
University of Nigeria

Ojiako Godfrey Ogbo
Nnamdi Azikiwe University, Awka

doi: https://doi.org/10.37745/bjmas.0523 Published March 05, 2026

Citation: Chukwueke K.A.V. and Godfrey O.O. (2026) Barriers to Scaling Circular Economy Practices in Selected Nigerian Cities, *British Journal of Multidisciplinary and Advanced Studies*,7(2),1-14

Abstract: *Rapid urbanisation in Nigeria has intensified waste generation and exposed the limits of disposal-oriented waste management systems. While circular economy (CE) principles are increasingly referenced in policy discussions, their practical scaling remains limited. This study examines the systemic barriers constraining the expansion of circular economy practices in Awka, Enugu, and Onitsha in south-eastern Nigeria. Using a qualitative exploratory design, twelve focus group discussions were conducted with municipal officials, private recycling firms, informal waste actors, and community representatives. Thematic analysis revealed six interrelated barriers: regulatory fragmentation, infrastructural deficits, financial constraints, informal–formal disconnects, weak market demand, and institutional coordination gaps. Findings indicate that circular transition is not hindered by the absence of recovery activity, but by structural misalignments across governance, infrastructure, finance, and market systems. Disposal-oriented regulatory incentives reinforce mixed waste streams, while limited access to capital and unstable demand discourage technological upgrading and private investment. Informal actors, despite playing a central role in material recovery, remain institutionally excluded. Cross-city comparisons further demonstrate that administrative structure and commercial intensity shape transition dynamics. The study concludes that scaling circular economy practices in Nigerian cities requires coordinated governance reform, infrastructural investment, financial innovation, and inclusive institutional frameworks rather than isolated technical interventions.*

Keywords: circular economy; urban waste governance; institutional barriers; informal recycling sector; waste management systems; resource recovery; Nigerian Cities.

INTRODUCTION

Cities around the world are growing at an unprecedented pace. Alongside urban expansion comes rising industrial activity, higher consumption levels, and increasing pressure on already strained environmental systems. Most economies still operate under a linear model; extract, produce, consume, and dispose; which depends heavily on continuous resource extraction and

generates large volumes of waste (Scheel, Aguiñaga, and Bello 2020). This approach has contributed significantly to environmental degradation, biodiversity loss, and climate change (Geissdoerfer et al., 2017; Ghisellini et al., 2016). Global material use has more than tripled since 1970, and urban areas now account for the majority of energy use, resource consumption, and greenhouse gas emissions (UNEP, 2021; Kaza et al., 2018). As cities continue to expand, the limits of this linear system are becoming increasingly visible.

In response, circular economy (CE) has gained attention as an alternative model that seeks to reduce waste, extend product life cycles, and keep materials in productive use for as long as possible. Rather than treating waste as an inevitable by-product, the circular economy reimagines it as a resource. It promotes reuse, repair, remanufacturing, recycling, and the redesign of products and systems to minimize resource inputs (Kirchherr et al., 2017; Murray et al., 2017). Beyond waste management, CE represents a broader transformation of how value is created and maintained within economies. It draws on ideas from industrial ecology, sustainable supply chains, and innovative business models that prioritize service provision over ownership (Lieder & Rashid, 2016; Pomponi & Moncaster, 2017). Increasingly, the circular economy is framed not just as an environmental strategy but as a structural shift in how economies function.

Globally, policy momentum around circular economy principles has grown significantly. The European Union has embedded circularity into its Green Deal and Circular Economy Action Plan, emphasizing eco-design standards, extended producer responsibility, and resource efficiency (European Commission, 2020). Internationally, circular approaches are closely linked to achieving the Sustainable Development Goals (SDGs), particularly those focused on sustainable cities and responsible consumption (Schroeder et al., 2019; UNEP, 2021). Studies suggest that circular strategies can reduce emissions, enhance resource productivity, and stimulate job creation in emerging green sectors (Geissdoerfer et al., 2017; Zhu et al., 2010).

Yet, while circular economy ideas are gaining traction globally, their implementation is far from uniform. The realities of developing-country contexts introduce additional layers of complexity. Rapid urban growth, limited infrastructure, informal settlements, and fragmented governance structures often make coordinated resource recovery systems difficult to establish (Guerrero et al., 2013; Wilson et al., 2006). In many African cities, informal recycling networks and repair economies already demonstrate forms of circular practice. However, these activities tend to operate outside formal policy frameworks and are rarely supported through institutional investment (Nzeadibe & Iwuoha, 2008; Medina, 2007). As a result, circularity often remains informal and survival-driven rather than systematically integrated into urban planning and economic development strategies.

Nigeria illustrates this tension clearly. As Africa's most populous country and one of its fastest-urbanizing nations, Nigeria faces mounting waste management challenges. Urban centers generate substantial volumes of municipal solid waste, much of which is poorly managed (Kaza et al., 2018). Open dumping and uncontrolled landfilling remain common, while formal recycling infrastructure is limited. Informal waste collectors and recyclers play a crucial role in recovering materials, yet their activities are rarely embedded within structured governance

systems (Oguntoyinbo, 2012). At the same time, policy discussions increasingly reference circular economy ideas, including extended producer responsibility and waste valorization. The gap between policy aspiration and on-the-ground implementation, however, remains significant.

The barriers to scaling circular economy practices in Nigerian cities extend beyond technical infrastructure. Institutional fragmentation across federal, state, and local levels complicates policy alignment and enforcement (Nwaka & Olatunji, 2020). Limited public finance constrains investment in recovery facilities and modern processing technologies, while private investors often perceive environmental sectors as high risk (World Bank, 2018). Consumer behavior, low awareness of waste segregation, and preference for inexpensive disposable products further reduce market demand for circular alternatives (Murray et al., 2017).

Technological and infrastructural gaps compound these challenges. Effective circular systems rely on reliable waste collection networks, sorting facilities, digital tracking mechanisms, and efficient recycling technologies (Lieder & Rashid, 2016). In many Nigerian cities, waste segregation at source is minimal, and supply chains for recovered materials are poorly coordinated. Extended Producer Responsibility frameworks exist in principle, but enforcement remains inconsistent (Ezeudu, 2024). Moreover, limited data on waste flows and recycling performance makes strategic planning difficult (UNEP, 2021).

Urban spatial dynamics add further complexity. Rapid and often unplanned urban expansion has produced dispersed settlements with limited infrastructure connectivity. Informal settlements frequently lack organized waste services, leading to practices such as open burning and illegal dumping (Guerrero et al., 2013). Integrating circular economy principles into such environments requires coordination across urban planning, infrastructure provision, and environmental governance which is an institutional challenge in itself.

Despite these obstacles, Nigeria also possesses significant opportunities for circular transition. The informal recycling sector demonstrates entrepreneurial adaptability, and growing digital innovation ecosystems could facilitate new models of material tracking and decentralized recovery. International climate finance and sustainability-linked investment mechanisms may provide additional leverage. However, systematic research examining the structural barriers that prevent circular initiatives from scaling in Nigerian urban contexts remains limited.

This study responds to that gap. It examines the multidimensional barriers, viz a viz governance-related, financial, infrastructural, technological, socio-cultural, and market-based; that constrain the scaling of circular economy practices in Nigerian cities. By situating these barriers within broader urban governance and socio-economic realities, the study contributes to both academic debates and policy discussions on how circular economy transitions can be meaningfully advanced in rapidly urbanizing African contexts.

METHODOLOGY

Research Design

This study employed a qualitative exploratory design using Focus Group Discussions (FGDs) to examine barriers to scaling circular economy practices in south-eastern Nigerian cities. An exploratory qualitative approach was selected due to the emergent and institutionally fragmented nature of Nigeria's circular economy transition (Omokaro et al., 2026). FGDs were used to capture interactive stakeholder perspectives within multi-actor waste governance systems, consistent with prior Nigerian solid waste and circular economy studies that applied group-based qualitative methods to analyse governance and co-production dynamics (Ezeudu et al., 2021; Iyamu, 2023). The design prioritised analytical depth and systemic insight rather than statistical generalisation.

Study Area

The research was conducted in Awka, Enugu, and Onitsha in south-eastern Nigeria. The cities were purposively selected to reflect variation in administrative structure, commercial intensity, and informal sector activity. Onitsha represents a dense commercial hub with significant informal material recovery activity. Enugu reflects a historically industrial and administrative centre with relatively structured municipal systems. Awka is a rapidly expanding administrative capital. Urban variation in south-eastern Nigeria has been shown to shape circular economy implementation dynamics, particularly in market-driven waste systems (Ezeudu et al., 2021).

Sampling and Participants

Purposive sampling was used to ensure representation of key actors across formal and informal waste governance systems. The inclusion of informal actors reflects evidence that material recovery systems in Nigeria are strongly dependent on informal sector participation (Onyekwere et al., 2026; Nwosu, 2025).

In each city, four FGDs were conducted (12 total), comprising:

1. Municipal/regulatory officials
2. Private recycling and waste firms
3. Informal waste actors (waste pickers, scrap dealers, aggregators)
4. Community representatives, SMEs, and civil society actors

Each FGD included 6–8 participants, consistent with qualitative methodological guidance for effective group interaction and depth (Iyamu, 2023).

Data Collection

A semi-structured discussion guide was developed from circular economy and Nigerian waste governance literature (Omokaro et al., 2026; Ezeudu et al., 2021).

Themes included:

- Awareness of circular economy principles
- Existing recovery and reuse practices
- Regulatory and policy constraints
- Infrastructure and technology gaps

- Financial and market barriers
- Institutional coordination challenges

Each session lasted 90–120 minutes, was audio-recorded with consent, and transcribed verbatim.

Data Analysis

The data were analysed using thematic analysis, a method widely applied in sustainability and circular economy research to identify structural barriers and governance patterns (Edeh & Onu, 2025).

The process involved:

1. Open coding to identify recurring constraints and stakeholder perceptions
2. Axial coding to group related codes into barrier categories
3. Selective coding to develop higher-order themes (regulatory, financial, infrastructural, socio-cultural, technological, governance)

Cross-city comparison and inter-stakeholder comparison were conducted to distinguish systemic from context-specific barriers, consistent with socio-technical urban waste assessment approaches (Iyamu, 2023).

Ethical Considerations

Participation was voluntary and informed consent was obtained. Confidentiality and anonymity were ensured through de-identification during transcription and reporting. Ethical procedures followed established social science research standards as applied in Nigerian waste governance studies (Ezeudu et al., 2021).

FINDINGS

Analysis of the twelve focus group discussions across Awka, Enugu, and Onitsha revealed six interrelated categories of barriers constraining the scaling of circular economy (CE) practices: regulatory fragmentation, infrastructural deficits, financial constraints, informal–formal disconnects, weak market demand, and institutional coordination gaps.

Regulatory and Policy Fragmentation

Participants described enforcement that is visible but narrowly focused on sanitation and revenue generation. Monthly environmental sanitation exercises and revenue generation were strict priorities, yet there were no measurable recycling targets or segregation requirements for contractors. Collection firms are paid per evacuation trip, so mixed waste is transported directly to dumpsites without recovery incentives, reflecting the disposal orientation noted in Nigerian waste governance literature (Omokaro et al., 2026). Recyclers reported that permits for small processing yards often require approvals from both state environmental agencies and local authorities, with unclear documentation requirements. Several operators described waiting months for clearance while still facing inspection visits. Informal waste pickers reported being removed from dumpsites by local task forces despite supplying materials to licensed buyers, reinforcing exclusion from formal policy structures.

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Publication of the European Centre for Research Training and Development -UK

Infrastructure and Technological Constraints

Stakeholders noted that most waste arrives at dumpsites unsorted. There are few functional material recovery facilities, and sorting is largely manual. In dense market areas, waste accumulation outpaces evacuation capacity, a condition also observed in southeastern Nigerian markets (Ezeudu et al., 2021). Small recyclers rely on basic crushing or baling machines powered by diesel generators due to unstable electricity. Participants explained that fuel costs significantly reduce margins, making equipment upgrades unrealistic. Without sorting lines or transfer stations, recovery remains slow and labour intensive.

Financial and Investment Barriers

Operators detailed the cost of entry into recycling. Basic plastic washing and pelletising lines were described as requiring substantial upfront capital, often beyond the reach of SMEs. Participants stated that commercial banks request collateral comparable to real estate assets, which most operators lack. There were no reported tax rebates, equipment subsidies, or guaranteed government procurement schemes for recycled products. Municipal officials confirmed the absence of structured financial incentives, consistent with wider assessments of weaknesses in Nigeria's circular transition pathway (Omokaro et al., 2026).

Informal–Formal System Disconnect

Informal collectors described daily door to door collection of plastics, metals, and cartons, which are sold to aggregation yards. Despite supplying a significant share of recyclable materials, they operate without registration, contracts, or protective equipment. Regulators acknowledged that municipal waste plans do not formally integrate these actors. There are no structured data sharing systems or contractual partnerships, echoing documented dependence on informal labour without formal inclusion strategies (Onyekwere et al., 2026; Nwosu, 2025). This separation limits coordinated scaling and system planning.

Weak Market Demand and Behavioural Barriers

Participants reported that households rarely separate waste at source, increasing contamination of recyclable streams. SMEs engaged in recycling stated that locally processed materials often struggle to compete with cheaper imported plastic products. Public awareness campaigns on waste segregation were described as sporadic rather than sustained. Low demand for recycled inputs reduces price stability and discourages expansion, reinforcing patterns identified in Nigerian circular economy implementation research (Mashi et al., 2026).

Institutional Coordination Gaps

Stakeholders described situations where state environmental agencies, waste management authorities, and local governments issue separate directives to operators. Approval for recycling sites may require engagement with multiple offices, often without a unified framework. Collaborative initiatives between public agencies and private recyclers were described as pilot projects tied to specific administrations rather than permanent programmes. This pattern reflects earlier analyses of fragmented solid waste governance in Nigeria (Ezeudu et al., 2021), limiting sustained circular economy expansion.

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Publication of the European Centre for Research Training and Development -UK

Cross-City and Stakeholder Comparisons

- Onitsha demonstrated the strongest informal recovery networks but weakest formal coordination.
- Enugu exhibited relatively structured municipal systems but slow policy innovation.
- Awka showed emerging initiatives constrained by limited infrastructure and investment.

Regulators emphasized policy and funding limitations; private firms focused on financial risk and market instability; informal actors highlighted exclusion and operational insecurity; community groups stressed awareness and behavioural gaps.

Overall, findings indicate that barriers are systemic and interdependent rather than isolated. Scaling circular economy practices in southeastern Nigerian cities requires coordinated reforms across regulatory, infrastructural, financial, and socio-institutional domains.

DISCUSSION

This study examined barriers constraining the scaling of circular economy (CE) practices in Awka, Enugu, and Onitsha through multi-stakeholder perspectives. The findings indicate that constraints to circular transition in southeastern Nigeria are systemic and structurally embedded within existing waste governance arrangements. Rather than isolated operational weaknesses, the barriers reflect deeper misalignments between regulatory incentives, infrastructure provision, financial systems, informal sector realities, and institutional coordination. This systemic pattern aligns with broader national assessments that characterize Nigeria's waste governance framework as structurally fragmented and disposal-oriented (Omokaro et al., 2026).

Regulatory fragmentation emerged as a central constraint to scaling circular economy practices. Participants described visible enforcement activities such as monthly environmental sanitation exercises and revenue collection initiatives, demonstrating that regulatory presence is not absent. However, these mechanisms are primarily oriented toward public cleanliness and compliance rather than material recovery or waste valorisation. Enforcement prioritises evacuation and sanitation orderliness, while measurable recycling targets, segregation requirements, and recovery-linked contractor incentives remain largely absent. This absence reinforces a linear waste evacuation model and sustains disposal-oriented practices. Omokaro et al. (2025) similarly argue that Nigeria's waste governance regime remains landfill-oriented, with limited operational integration of circular economy principles. Beyond incentive design, recyclers reported overlapping permit requirements and unclear documentation processes across state and local authorities, reflecting administrative duplication and regulatory ambiguity. Such fragmentation is consistent with broader analyses of circular economy governance in African urban contexts, where institutional silos undermine coherent implementation (Giwah & Nwokediegwu, 2021). The reported eviction of informal waste pickers from dumpsites despite their contribution to material recovery further illustrates regulatory inconsistency and exclusion, echoing earlier findings that Nigerian waste policies

often marginalize informal actors despite their systemic importance to material circulation (Mbah & Nzeadibe, 2017).

Infrastructural and technological constraints significantly limit recovery efficiency across the three cities. The predominance of unsorted waste streams and the scarcity of functional material recovery facilities mean that sorting is largely manual and concentrated at dumpsites or aggregation yards. Similar infrastructural gaps have been documented in southeastern Nigerian urban markets, where inadequate sorting systems hinder valorisation efforts (Ezeudu et al., 2021). The dependence of small recyclers on diesel-powered equipment due to unstable electricity supply further increases operational costs and restricts technological upgrading. Financing and infrastructure are closely linked in this context; inadequate capital access prevents investment in mechanised sorting lines or transfer stations, reinforcing small-scale and labour-intensive operations. **Wilson, Velis and Cheeseman** (2006) likewise note that infrastructural deficits in Anambra State constrain circular economy implementation by limiting economies of scale and material quality control.

Financial barriers compound these infrastructural weaknesses. Participants described high capital requirements for plastic washing and pelletising lines and stringent collateral conditions imposed by commercial banks. The absence of structured fiscal incentives, tax rebates, or guaranteed procurement schemes further increases investment risk. These findings align with broader analyses identifying financing gaps as a critical bottleneck in Nigeria's circular transition pathway (Omokaro et al., 2026; Mazzucato, 2018). Mazzucato (2018) emphasize that fragmented financing mechanisms and reliance on evacuation-based revenue models discourage long-term investment in recovery infrastructure. Without blended finance instruments or public–private risk-sharing arrangements, private sector expansion remains constrained.

The structural disconnect between informal recovery networks and formal municipal systems represents another key barrier. Informal collectors provide daily door-to-door material recovery services and supply aggregation yards, yet operate without formal registration, contracts, or occupational protection. Municipal officials acknowledged the absence of structured integration mechanisms. This paradox; where informal actors are indispensable yet institutionally excluded, has been widely documented in Nigerian waste governance (Mbah & Nzeadibe, 2017; Nwosu, 2025). Exclusion limits data integration, undermines planning accuracy, and restricts access to financial or technological support. The findings suggest that formal recognition and cooperative contracting models may be necessary to bridge this divide, consistent with calls for inclusive governance frameworks in African megacities (Giwah & Nwokediegwu, 2021).

Market and behavioural barriers further constrain scaling efforts. Low levels of household source segregation increase contamination and processing costs, while intermittent awareness campaigns limit behavioural institutionalisation. Mashi et al. (2026) demonstrate that public engagement and socio-economic drivers significantly influence participation in CE-based waste practices, suggesting that behavioural change requires sustained institutional support. Participants also reported difficulty competing with cheaper imported plastic products,

reducing price stability for locally recycled materials. Weak market demand thus reinforces financial risk and discourages reinvestment, confirming broader observations that circular transitions require simultaneous supply- and demand-side interventions (Debrah et al., 2022). Institutional coordination gaps intensify these constraints. Stakeholders described fragmented communication between environmental agencies, waste authorities, and local governments, with approvals often requiring engagement across multiple offices. Such fragmentation has been identified as a recurring barrier in Nigerian waste governance, where overlapping mandates and inconsistent directives hinder coherent implementation (Agyemang, & Powell, 2020; Velis, 2017). The characterization of collaborative initiatives as administration-specific pilot projects rather than institutionalised frameworks suggests limited policy continuity. Without integrated governance platforms, scaling efforts remain episodic rather than systemic. Cross-city comparisons further illustrate contextual variation in barrier configuration. Onitsha's dense commercial environment sustains vibrant informal recovery networks but exhibits weak formal coordination, reinforcing the informal–formal disconnect described in the literature (Mbah & Nzeadibe, 2017). Enugu demonstrates relatively structured municipal systems yet slower policy innovation, reflecting administrative stability without transformative reform. Awka's emerging initiatives remain constrained by infrastructural and financial fragility, consistent with findings that smaller urban centres often lack investment depth required for CE expansion (**Wilson, Velis, & Cheeseman**, 2006).

Collectively, the findings confirm that barriers to CE scaling in south-eastern Nigeria are interdependent. Disposal-oriented regulatory incentives reinforce mixed waste streams; mixed waste increases infrastructural strain; infrastructural deficits elevate operational costs; financial constraints deter technological upgrading; weak demand destabilises pricing; and fragmented coordination prevents integrated reform. This systemic interdependence supports the argument that circular transition in Nigeria is fundamentally a governance restructuring challenge rather than solely a technological or environmental intervention (Omokaro et al., 2026; Giwah & Nwokediegwu, 2021). Sustainable scaling will therefore require aligned reforms across regulatory design, infrastructure investment, financial innovation, informal sector inclusion, market development, and institutional coordination.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined systemic barriers to scaling circular economy (CE) practices in Awka, Enugu, and Onitsha. The findings show that circular transition in south-eastern Nigerian cities is constrained not by absence of recovery activity, but by structural misalignment across regulatory systems, infrastructure provision, financial mechanisms, and institutional coordination. Regulatory fragmentation, weak enforcement, infrastructural deficits, limited access to finance, exclusion of informal actors, and weak market demand operate in combination rather than isolation. Urban variation further shapes transition capacity, with differences in administrative structure, commercial intensity, and informal sector integration influencing how barriers manifest. Overall, circular economy implementation in these cities remains embedded within broader governance limitations, indicating that transition requires coordinated structural reform rather than isolated technical interventions.

Recommendations

Advancing circular economy practices in southeastern Nigerian cities requires an integrated reform strategy anchored in regulatory coherence, infrastructural investment, financial innovation, and inclusive governance. First, state and municipal authorities should develop explicit circular economy policy frameworks that shift waste management systems from disposal-oriented approaches toward resource recovery and valorization. Regulatory mandates should be harmonized across agencies to reduce overlap, clarify responsibilities, and strengthen enforcement capacity. Clear policy direction would reduce uncertainty and encourage private sector investment, addressing systemic weaknesses identified in Nigeria's waste governance regime (Omokaro et al., 2026).

Second, substantial investment in foundational infrastructure is necessary to enable scaling. Establishing decentralized material recovery facilities in high-waste commercial zones, improving source segregation systems, and supporting SMEs with access to affordable processing technologies would significantly enhance recovery efficiency. Evidence from southeastern Nigerian markets shows that infrastructure gaps directly limit circular valorization potential (Ezeudu et al., 2021). Without strengthening physical systems, policy reforms alone are unlikely to yield measurable transformation.

Third, deliberate integration of the informal sector is essential. Municipal authorities should adopt structured recognition and engagement mechanisms, including cooperative registration systems, contractual arrangements, and capacity-building programs. Informal waste workers are central to Nigeria's material recovery networks, yet their exclusion limits coordination, data visibility, and scalability (Onyekwere et al., 2026; Nwosu, 2025). Formal–informal integration would enhance efficiency while improving livelihood security and institutional trust.

Fourth, financial and market-based incentives must be expanded to reduce investment risk and stimulate demand. Targeted green financing schemes, tax incentives for recycled inputs, and public procurement policies favoring circular products could improve business viability. Strengthening consumer awareness and promoting behavioural change through education campaigns would further increase market demand and improve material quality, consistent with evidence that socio-economic drivers significantly influence circular engagement (Mashi et al., 2026).

Finally, institutional coordination mechanisms should be formalized through city-level multi-stakeholder platforms that include regulators, private operators, informal representatives, and civil society actors. Institutionalizing co-production models and shared data systems would reduce fragmentation and support long-term transition stability, addressing coordination deficits previously observed in Nigerian waste governance systems (Ezeudu et al., 2021).

In sum, scaling circular economy practices in southeastern Nigerian cities requires simultaneous reforms across governance, infrastructure, finance, markets, and social inclusion. Incremental or isolated interventions are unlikely to produce systemic change. However, coordinated and context-sensitive strategies can position these cities to transition toward more sustainable and resource-efficient urban systems.

REFERENCES

Agyemang, M., & Asase, M. (2020). E-waste management in Ghana: An analysis of the legal framework and policy implications for circular economy. *Waste Management & Research*, *38*(5), 520–529. https://doi.org/10.1177/0734242X20904353

Agyemang, M., & Powell, R. (2020) The circular economy and Africa: Challenges and opportunities. *African Journal of Science, Technology, Innovation and Development, 12*(5), 597–609. https://doi.org/10.1080/20421338.2019.1645509

Bocken, N. M. P., de Pauw, I., Bakker, C., & van der Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, *33*(5), 308–320. https://doi.org/10.1080/21681015.2016.1172124

Debrah, J. K., Teye, G. K., & Dinis, M. A. P. (2022) Barriers and challenges to waste management hindering the circular economy in Sub-Saharan Africa. *Urban Science, 6*(3), 57. https://doi.org/10.3390/urbansci6030057

Edeh, A. M., & Onu, L. O. (2025). *Perceptions and implementation of sustainability practices in small and medium-sized enterprises in Nigeria's retail sector: A qualitative analysis*. Lund University. https://lup.lub.lu.se/student-papers/search/publication/9213708

Ellen MacArthur Foundation. (2015). *Towards a circular economy: Business rationale for an accelerated transition*. Ellen MacArthur Foundation. https://ellenmacarthurfoundation.org

European Commission. (2020). *A new circular economy action plan: For a cleaner and more competitive Europe*. European Commission. https://ec.europa.eu/environment/circular-economy/

Ezeudu, O. B. (2024). Harnessing the drivers and barriers to implementation of extended producer responsibility for circular economy in Nigeria. *Circular Economy and Sustainability*, *4*(2), 1461-1486.

Ezeudu, O. B., Ezeudu, T. S., & Ugochukwu, U. C. (2021). Enablers and barriers to implementation of circular economy in solid waste valorization: The case of urban markets in Anambra, Southeast Nigeria. *Cleaner Engineering and Technology*, *4*, 100219. https://www.sciencedirect.com/science/article/pii/S2666597271000519

Ezeudu, O. B., Oraelosi, T. C., & Agunwamba, J. C. (2021). Co-production in solid waste management: Analyses of emerging cases and implications for circular economy in Nigeria. *Environmental Science and Pollution Research*, *28*, 21730–21745. https://link.springer.com/article/10.1007/S11356-021-14471-8

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy – A new sustainability paradigm? *Journal of Cleaner Production, 143*, 757–768. https://doi.org/10.1016/j.jclepro.2016.12.048

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production, 114*, 11–32. https://doi.org/10.1016/j.jclepro.2015.09.007

Giwah, M. L., & Nwokediegwu, Z. S. (2021) Designing a circular economy governance framework for urban waste management in African megacities. *International Journal of Environmental Science and Technology, 18*, 3507–3522. https://doi.org/10.1007/s13762-020-03009-5

Guerrero, L. A., Maas, G., & Hogland, W. (2013). Solid waste management challenges for cities in developing countries. *Waste Management, 33*(1), 220–232. https://doi.org/10.1016/j.wasman.2012.09.008

Iyamu, H. O. (2023). *Municipal solid waste management in low-income economies: Trialling a socio-technical assessment framework in Nigeria towards better management* (Doctoral dissertation). Murdoch University. https://researchportal.murdoch.edu.au/esploro/outputs/doctoral/Municipal-solid-waste-management-in-low-income/991005602265007891

Kaza, S., Yao, L., Bhada-Tata, P., & Van Woerden, F. (2018). *What a waste 2.0: A global snapshot of solid waste management to 2050*. World Bank. https://doi.org/10.1596/978-1-4648-1329-0

Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling, 127*, 221–232. https://doi.org/10.1016/j.resconrec.2017.09.005

Lazarevic, D., & Valve, H. (2017). Narrating expectations for the circular economy: Towards a common and contested European transition. *Energy Research & Social Science, 31*, 60–69. https://doi.org/10.1016/j.erss.2017.05.006

Lieder, M., & Rashid, A. (2016). Towards circular economy implementation: A comprehensive review in context of manufacturing industry. *Journal of Cleaner Production, 115*, 36–51. https://doi.org/10.1016/j.jclepro.2015.12.042

Mashi, S. A., Inkani, A. I., & Umar, A. (2026). From awareness to practice: Socioeconomic drivers and public engagement in circular economy–based urban waste management. *Discover Sustainability*. https://link.springer.com/article/10.1007/s43615-026-00730-8

Mazzucato, M. (2018). Mission-oriented innovation policies: Challenges and opportunities. *Industrial and Corporate Change, 27*(5), 803–815.* https://doi.org/10.1093/icc/dty034

Mbah, P. O., & Nzeadibe, T. C. (2017). Inclusive municipal solid waste management and the integration of informal waste pickers in Nigeria. *Habitat International, 63*, 50–60. https://doi.org/10.1016/j.habitatint.2017.03.001

Medina, M. (2007). *The world's scavengers: Salvaging for sustainable consumption and production*. AltaMira Press.

Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: An interdisciplinary exploration of the concept and application in a global context. *Journal of Business Ethics, 140*(3), 369–380. https://doi.org/10.1007/s10551-015-2693-2

Nwaka, G. I., & Olatunji, A. O. (2020). Urban governance and environmental sustainability challenges in Nigeria. *Journal of Sustainable Development in Africa, 22*(4), 45–60.

Nwosu, C. V. (2025). *Creating a design practice framework to better integrate the informal economy in Nigeria* (Doctoral dissertation). University of Calgary. https://doi.org/10.11575/PRISM/50481

Nzeadibe, T. C., & Iwuoha, H. C. (2008). Informal waste recycling and urban governance in Nigeria. *Habitat International, 32*(3), 350–358. https://doi.org/10.1016/j.habitatint.2007.09.006

Ogunmakinde, O. E. (2019). Developing a circular economy in construction and demolition waste management in Nigeria. *Resources, Conservation and Recycling, 143*, 98–109. https://doi.org/10.1016/j.resconrec.2018.12.004

Oguntoyinbo, O. O. (2012). Informal waste management system in Nigeria and barriers to an inclusive modern waste management system: A review. *Public Health*, *126*(5), 441–447.

Olawumi, T. O., & Chan, D. W. M. (2018). Barriers to implementation of circular economy in the construction industry: A developing country perspective. *Journal of Cleaner Production, 172*, 386–400. https://doi.org/10.1016/j.jclepro.2017.10.158

Omokaro, G. O., Michael, I., Efeni, O. S., & Adeyanju, O. I. (2026). Waste management in Nigeria: Systemic failures, circular economy pathways and sustainable solutions. *Environmental Development*. https://www.sciencedirect.com/science/article/pii/S2211464525002295

Onyekwere, C. E., Stevenson, V., & Whitman, C. (2026). Towards circular economy: The role of informal waste workers in construction and demolition waste management in Nigeria. In *Sustainable Waste Management and Circular Economy* (pp. xx–xx). Springer. https://link.springer.com/chapter/10.1007/978-3-031-94316-4_29

Pomponi, F., & Moncaster, A. (2017). Circular economy for the built environment: A research framework. *Journal of Cleaner Production, 143*, 710–718. https://doi.org/10.1016/j.jclepro.2016.12.055

Scheel, C., Aguiñaga, E., & Bello, B. (2020). Decoupling economic development from the consumption of finite resources using circular economy. A model for developing countries. *Sustainability*, *12*(4), 1291.

Schroeder, P., Anggraeni, K., & Weber, U. (2019). The relevance of circular economy practices to the Sustainable Development Goals. *Journal of Industrial Ecology, 23*(1), 77–95. https://doi.org/10.1111/jiec.12732

UN-Habitat. (2020). *Waste wise cities tool: Step-by-step guide for assessing municipal solid waste management performance*. United Nations Human Settlements Programme. https://unhabitat.org

United Nations Environment Programme (UNEP). (2021). *Global resource outlook 2021: Natural resources for the future we want*. UNEP. https://www.resourcepanel.org/reports/global-resources-outlook

Velis, C. A. (2017). Waste pickers in global south: Informal recycling sector governance challenges. *Waste Management & Research, 35*(11), 1097–1099.* https://doi.org/10.1177/0734242X17736398

Velis, C. A., & Brunner, P. H. (2013). Recycling and resource efficiency: It is time for a change from quantity to quality. *Waste Management & Research, 31*(6), 539–540. https://doi.org/10.1177/0734242X13495963

Wilson, D. C., Velis, C., & Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. *Habitat International, 30*(4), 797–808.* https://doi.org/10.1016/j.habitatint.2005.09.005

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Publication of the European Centre for Research Training and Development -UK
Wilson, D. C., Velis, C., & Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. *Habitat International, 30*(4), 797–808. https://doi.org/10.1016/j.habitatint.2005.09.005

World Bank. (2018). *What a waste 2.0: A global snapshot of solid waste management to 2050*. World Bank. https://openknowledge.worldbank.org/handle/10986/30317

Zhu, Q., Geng, Y., & Lai, K. H. (2010). Circular economy practices among Chinese manufacturers varying in environmental-oriented supply chain cooperation and performance. *Journal of Environmental Management, 91*(6), 1324–1331. https://doi.org/10.1016/j.jenvman.2010.02.013