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EDITORIAL

Transforming African Cities: Design Technologies, Urban Systems, and Environmental Sustainability

Welcome to the Twentieth Volume 3rd Issue of the Africa Habitat Review-Journal of the Faculty of Built Environment and Design. This issue presents critically analysed papers on matters relating to Transforming African Cities: Design Technologies, Urban Systems, and Environmental Sustainability.

Harnessing Climate Finance for Solid Waste Management in Nairobi presents a timely interrogation of how African cities can transition from linear, waste-heavy urban metabolisms to circular, regenerative systems through market-based climate mechanisms. As cities like Nairobi struggle with overwhelming waste volumes and insufficient management infrastructure, this paper shows how carbon markets, circular economy models, and emissions-reduction strategies offer viable pathways to sustainable transformation. The study not only quantifies potential emissions reductions but also reframes urban waste as a climate asset capable of attracting global finance. This editorial highlights the paper's contribution to climate urbanism, policy innovation, and Kenya's pursuit of green urban resilience.

The article titled *Multicriteria Evaluation of the Quality of Service (QoS) of Informal Public Transport* offers a nuanced and data-rich assessment of Nairobi's informal transport ecosystem—an essential yet structurally under-serviced mobility network. This editorial highlights the manuscript's strength in combining gender analysis, satisfaction indices, behavioural attributes, and service-level indicators to expose systemic inequalities and service inefficiencies in the IPT sector. The study's refined application of multi-criteria evaluation provides strong policy guidance for metropolitan transport reform, particularly as African cities move toward equitable, safe, and demand-responsive mobility systems.

Green Infrastructure for Urban Resilience advances an urgently needed rethinking of stormwater management within African urbanism. As climate variability intensifies, the limitations of grey infrastructure become increasingly evident. This paper positions nature-based solutions not merely as ecological amenities but as socio-political tools that address inequality, public health, and disaster risk in Nairobi. The editorial underscores the paper's layered methodology—combining GIS, hydrology, and governance analysis—to propose an integrated resilience framework applicable to African cities grappling with flooding, informality, and infrastructural neglect.

The paper, *A Machine Learning–Based Computational Framework for Road Performance Assessment*, marks a significant methodological advancement in infrastructure evaluation in developing countries. By distilling a high-performing Random Forest model into an interpretable polynomial equation, the study bridges the gap between computational sophistication and policy usability. This editorial highlights how this research offers a replicable, scalable, and evidence-based model that can transform road maintenance prioritisation and investment planning—particularly in contexts where roads remain a critical determinant of social and economic mobility.

In Performance of Mortgage-Financed Construction Projects in Kenya, the authors confront a largely under-researched space: how mortgage financing shapes construction performance outcomes. This editorial highlights the study's empirical breadth, revealing cost overruns, schedule delays, safety lapses, and quality inefficiencies that widen the performance gap in the affordable housing supply chain. The paper's implications for financial institutions, developers, and policymakers align strongly with ongoing national housing reforms, providing a grounded reference for risk mitigation in Kenya's expanding mortgage market.

The article, *A Planning Framework for Flood Mitigation in Nakuru City*, offers a holistic, spatially grounded perspective on one of Kenya's fastest-growing urban centres. By integrating climatic data, GIS analysis, and on-ground observations, the study proposes a systematic approach to flood resilience centred on land-use planning, environmental conservation, and multi-stakeholder coordination. This editorial acknowledges the paper's relevance to national disaster-preparedness discourse and its potential to guide policy reforms in secondary cities increasingly vulnerable to climate extremes.

Spatial-Temporal Impacts of Port Development on City Land Use offers a critical and timely examination of how port expansion reshapes urban ecologies, economies, and settlement patterns. The paper's findings—linking vegetation loss and open-space decline to port development—open an important discussion on the sustainability of infrastructural megaprojects in African coastal cities. This editorial highlights its contribution to debates on port–city integration, ecological preservation, and the governance of strategic economic zones.

The study *Land Use Consolidation as a Tool for Sustainable Rural Development* offers an insightful reflection on rural land fragmentation and its implications for productivity, resilience, and socio-economic well-being. By situating Tabaka Ward within broader debates on tenure systems and agricultural sustainability, the paper demonstrates how community-led consolidation efforts can catalyse inclusive rural transformation. This editorial recognises the manuscript's relevance for national policy reforms in land management, food security, and decentralised planning.

The article titled "*Assessing Household Vulnerability to Climate Risks in Mukuru SPA*" provides a compelling, empirically grounded examination of climate vulnerability in one of Nairobi's largest informal settlements. The study's strength lies in combining statistical modelling with spatial analysis and lived experiences, revealing the interconnectedness of poverty, tenure insecurity, infrastructure deficits, and climate exposure. This editorial underscores the paper's contribution to resilience planning and its alignment with ongoing efforts to develop just, climate-adaptive informal settlement upgrading strategies.

The paper *Predictive Machine Learning Modelling of Urban Traffic Air Pollution* showcases the growing relevance of computational modelling in addressing Africa's escalating air-quality challenges. By integrating traffic dynamics, meteorological variables, and machine learning, the study offers predictive insights crucial for urban environmental policy. This editorial highlights its applicability to transport planning, emission regulation, and the design of healthier cities.

Understanding Place Dependence in Landscape Settings provides a theoretically rich and methodologically rigorous review of how people form functional attachments to landscapes. By tracing global scholarship and identifying gaps in African scholarship, the paper strengthens the conceptual foundations of place-making, landscape governance, and socio-spatial behaviour. This editorial acknowledges the importance of the review in guiding designers, planners, and researchers toward more context-sensitive approaches to public space, especially in African urbanism.

The article *Navigating Urban Sprawl and Green Space Loss* examines one of the most urgent threats to Nairobi's environmental sustainability. Through a case study of Kahawa West Community Park, the paper examines the socio-ecological consequences of unmanaged sprawl and the governance gaps that undermine green infrastructure. This editorial underscores how the study's findings align with global and national sustainability agendas and offer actionable strategies for reversing urban green-space decline.

In *Empowering Urban Margins*, the authors illuminate the ingenuity and resilience of informal settlement communities as they mobilise resources and social capital to secure land rights. This editorial recognises the study's significance in reframing tenure security not as a top-down administrative process but as a community-driven, participatory, and socially embedded endeavour. The findings contribute innovative

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insights into urban inclusivity, grassroots financing models, and the future of equitable city-making in Africa.

The article " *Industry 4.0 and Construction Project Labour Productivity (CPLP) in Kenya: Opportunities and Risks*" seeks to examine whether the adoption of Industry 4.0 technologies offers a practical solution to persistent labour productivity challenges in Kenya's construction sector or introduces new implementation risks. The purpose is to ground debates on digital transformation in empirically validated, project-level productivity determinants. The study adopts a post-positivist and pragmatic methodology, combining regression-based predictive modelling of construction projects in Nairobi with reflexive qualitative analysis informed by extensive industry experience. Key findings show that Project Information Flow and Project Materials Flow account for 88 per cent of variations in construction project labour productivity, confirming them as the dominant drivers of performance. While Industry 4.0 technologies can significantly strengthen these flows, their productivity benefits are conditional on workforce skills, infrastructure readiness, and effective change management. The article recommends a strategic, phased adoption of digital tools, prioritising human capacity development, resilient systems, and regulatory alignment to translate technological potential into sustained, measurable productivity gains rather than unrealised digital ambition.

This final article, *Structural Failures and Development Control in Kenya: A Regulatory and Institutional Analysis* offers a timely and incisive interrogation of one of Kenya's most persistent urban safety challenges. Drawing on a qualitative, desk-based research design, the study systematically reviews statutory frameworks, institutional practices, documented collapse cases, and comparative literature to examine how development control failures contribute to recurrent building collapses. The findings demonstrate that structural failures are not isolated technical accidents but the cumulative outcome of weak regulatory enforcement, compromised professional ethics, inadequate institutional capacity, and cost-driven developer behaviour. By synthesising these insights into a coherent conceptual framework, the article shifts the discourse from purely engineering explanations toward a governance-centred understanding of building safety. Its recommendations emphasise strengthened inspections, ethical accountability, institutional coordination, and sustained enforcement as prerequisites for safer urban development. As Kenya continues to urbanise rapidly, this article makes a compelling case that effective governance—rather than regulations alone—is the decisive factor in preventing structural failures and safeguarding public life.

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