Regional Studies

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/cres20

Smart urbanism in Africa: when theories do not fit with contextual practices

Francesco Tonnarelli & Luca Mora

To cite this article: Francesco Tonnarelli & Luca Mora (2023): Smart urbanism in Africa: when theories do not fit with contextual practices, Regional Studies, DOI: 10.1080/00343404.2023.2235407

To link to this article: https://doi.org/10.1080/00343404.2023.2235407

REGIONAL STUDIES
https://doi.org/10.1080/00343404.2023.2235407

Routledge Taylor & Francis Group
RSA Regional Studies Association

URBAN AND REGIONAL HORIZONS

Smart urbanism in Africa: when theories do not fit with contextual practices

Francesco Tonnarelli[a,b] and Luca Mora[b,c]

ABSTRACT

Theories of smart urbanism have overlooked the influence of contextual factors on the conception, planning and implementation of digital transformation practices across regions. To articulate this critique, we focus on African cities and draw on a diverse range of urban and regional scholarship. We present the core assumptions advanced in the mainstream literature on smart urbanism and prove their inability to fit the organisation of African urban contexts. Three main research questions emerge from this critical examination and offer new perspectives for expanding knowledge on how smart urbanism challenges recombine with place-based governance approaches, not only in Africa, but globally.

KEYWORDS

smart urbanism; urban innovation; governance; digital transformation; Africa

JEL O32, O33, R58

HISTORY Received 7 February 2023; in revised form 7 July 2023

1. INTRODUCTION

Smart urbanism is an emerging approach to urban sustainability enhancement that involves an innovation process in which the extensive application of digital technologies becomes a remedy for the sustainability challenges facing urban communities (Marvin et al., 2016). This approach to sustainable urban development has gained growing attention in urban and regional studies and plays a central role in international urban policies (Mouton & Burns, 2021; Su & Fan, 2023), including those formulated in Africa. African countries have expressed strong faith in technological innovation, which is perceived as the key to unleashing the power of urbanisation (Slavova et al., 2016). From the African Union's agenda (African Union Commission, 2015, 2020) to national strategies and local plans (Bandauko & Nutifafa Arku, 2023), smart urbanism has been repeatedly described as a potential solution to African urbanisation challenges. Such enthusiasm is fuelled by unprecedented growth in digital capabilities and the widespread adoption of digital devices that have allowed African countries to leapfrog traditional development paths while helping the continent enter the digital era (Denis, 2021).

Smart urbanism offers opportunities 'in many foundational areas of the digital economy to leverage [African] global and regional initiatives' (Broadband Commission, 2019, p. 10). However, for this opportunity to be realised, smart urbanism practices in Africa and the Global South need to be cautious in uncritically adopting the governance frameworks and policy recommendations brought forward in the extant academic literature. Research on smart urbanism has been widely criticised (Datta, 2015; Odendaal, 2014; Watson, 2015) for developing a body of knowledge that is largely dependent on the experiences of cities located in Western, industrialised and wealthy countries. It does not account for the specific characteristics of African and Southern urbanisation processes in terms of scale and pace (Parnell & Pieterse, 2014; Parnell & Walawege, 2011), history, and governance (Cohen, 2006; Fox, 2014). As a result, when mobilising existing theories, African cities face challenges in ensuring that the integration of digital technologies into urban life aligns with their specific contextual needs (Aurigi & Odendaal, 2021; Odendaal, 2021).

In response to this policy mobility challenge, several studies have attempted to 'provincialise' (Burns et al., 2021) smart urbanism. These studies have highlighted

CONTACT Luca Mora L.Mora@napier.ac.uk
[a] FinEst Center for Smart Cities, Tallinn University of Technology, Tallinn, Estonia
[b] Academy of Architecture and Urban Studies, Tallinn University of Technology, Tallinn, Estonia
[c] The Business School, Edinburgh Napier University, Edinburgh, UK

Supplemental data for this article can be accessed online at https://doi.org/10.1080/00343404.2023.2235407

the distance between unrealistic smart urbanism ideals and practical local conditions (Cinnamon, 2023; Guma & Monstadt, 2021) while portraying cities and communities as innovation producers rather than consumers of external ideas and resources (Baptista, 2015; Odendaal, 2022). A call for action emerges from this literature that recognises the need for a governance theory of smart urbanism tailored to the distinctive attributes of African urban environments. However, the available research falls short of achieving a twofold objective. First, it remains unclear which core assumptions of smart urbanism governance frameworks should be challenged to fit urban governance dynamics in African regions (Watson, 2021). Second, current studies do not clarify which lines of enquiry should be pursued to support Africa-related theoretical developments that address existing policy issues and implementation challenges (Ernstson et al., 2014; Peck, 2015).

This study helps to overcome this gap by exposing key inconsistencies that affect the theoretical propositions underpinning the three main governance dimensions of smart urbanism: institutional settings for urban innovation, urban innovation ecosystems and technological infrastructure (Mora et al., 2023). Our arguments draw on a combination of multiple data collection methods. First, we sourced relevant data from the literature on smart urbanism projects. Second, we conducted 10 expert interviews (see Appendix A in the supplemental data online[1]) online using a semi-structured protocol organised around the abovementioned governance dimensions. All interviews lasted approximately one hour and were conducted with public sector officials with experience in managing smart urbanism on the African continent. Third, we complemented these two data sources with lessons acquired from participant observations of smart urbanism projects promoted by the United Nations in various African countries, in which one of the authors has been actively involved as a strategic advisor. These countries included Djibouti, Eritrea, Ethiopia, Kenya, Nigeria, Somalia and South Africa. The data collected from these multiple sources were organised and analysed using thematic coding assisted by qualitative data analysis software. Through our examination, we uncover a set of questions and link them with areas of enquiry in urban and regional studies that have already recognised the limits of the existing theory in understanding and explaining the southern urban experience. To move beyond present conceptual borders and practical limitations, we argue that smart urbanism must dwell on this wider framing context.

The remainder of the paper is structured as follows. The next three sections introduce the theoretical inconsistencies identified in smart urbanism literature and present them within the framework of African urban development processes and governance approaches. In the discussion section, each inconsistency is linked to a set of critical yet unanswered research questions and to varying institutional, territorial and technological concepts from urban and regional studies, which can help expand smart urbanism research. Finally, the last section concludes the article by enhancing the call for smart urbanism research to be more attentive to contextualisation requirements and locally shaped development trajectories.

2. INSTITUTIONAL SETTING FOR URBAN INNOVATION

Political and institutional arrangements are determining factors in smart urbanism, shaping the ability of urban actors to promote urban sustainability enhancements (Ciasullo et al., 2020; Ehnert et al., 2018). According to the extant literature on smart urbanism, the key to success is the combination of three factors: the multilevel coordination of government actions, which is required to facilitate the sharing of data, technology, expertise and financial resources; coherent and integrated bodies of policies and regulations, which can simplify implementation processes and ensure a more effective governance structure; and public authorities able to formulate smart urbanism strategies and lead urban change in complex cross-sector collaborative environments (Mancebo, 2020). In particular, municipal governments are often assigned a leadership role in decision-making and orchestration (Clement et al., 2022), following the general assumption in urban and regional studies that substate entities are best positioned to deliver public services (Ahmad et al., 2005; Stren, 2012). This notion acknowledges the mutual interdependence between political and administrative levels (Bulkeley & Betsill, 2005; Hodson & Marvin, 2010), and the importance of a coherent distribution of political representation, fiscal responsibilities, and administrative functions between central and subnational governments (Ehnert et al., 2018; Keating, 2017). However, the smart urbanism theory overlooks the complexity of intergovernmental relations in African urban politics (Pieterse, 2018; Smit, 2018). Vertical and horizontal coordination between public authorities is often fragmented. Vertically, roles and responsibilities are not clearly defined; horizontally, transformation dynamics and urbanisation processes transcend administrative boundaries governed by single public authorities (Croese et al., 2021; Resnick, 2021).

Concerning fiscal and financial autonomy, most African countries centralise mandates and resources; municipal governments do not define and implement investment decisions and have limited control over sources of revenue, such as taxes, tariffs and fees (UCLG & Cities Alliance, 2018). Moreover, most municipal governments do not have access to debt financing (OECD et al., 2022). Without locally owned resources and financial instruments for investment, local governments cannot afford to undertake many urban development projects that can generate large economic and social returns, including smart urbanism projects (Devas, 2003). Further, without controlling revenue generation for public service delivery, municipal governments may lose interest in investing in digital innovation initiatives that may improve the quality and efficiency of their offerings (Mello & Ter-Minassian, 2020). For instance, multiple case study analyses demonstrate that municipal governments are more inclined to digitalise cadastral records when they are responsible for

managing tax-related revenue because property taxation is one of the favoured systems for income generation (Rochell et al., 2022). This, in turn, can trigger additional innovation. Digitalisation processes are instrumental in creating geospatial databases that form urban areas' spatial intelligence (Tao, 2013) while enabling new smart urbanism initiatives, with projects introducing data analytics for visualisation and decision-making to location-based services (INT.03).

The devolution of administrative functions and responsibilities has caused high fragmentation levels (Resnick, 2021) and weakened the reach of local urban politics in African urban settlements (Devas, 2001; Myers, 2011), creating a coordination void in infrastructure and service delivery at the urban scale. Infrastructure development, planning processes and policy formulation, for example, tend to be controlled nationally, with very little decision-making power left for the subnational levels of government (Cupers & Meier, 2020; Wiig & Silver, 2019). Simultaneously, the spatially splintered and informal nature of African urbanisation prevents local public authorities from focusing on city-scale service delivery and coordination, as many electricity, water, sanitation, waste removal and housing provision services are under the control of multiple private sector organisations that often operate outside formal regulatory systems defined by the public sector (Baptista, 2015; Guma, 2019; Lawhon, 2012; van Welie et al., 2018).

Despite being unable to perform their usual administrative functions and responsibilities, a growing number of local governments have begun to engage in international relations, a mandate previously held by national governments (Acuto, 2013). Local governments have directly developed their foreign relations, international commitments and development initiatives, generating the mushrooming of African associations, local public sector organisations, urban forums and mayor covenants. Resnick (2021) notes how this trend has raised 'the stakes of subnational competition' as mayors are gaining 'a global stage on which to hone their reputation and image' (p. 148) through transnational initiatives, while central governments, in turn, protect their power position with measures to constrain local-level autonomy. Some exceptions may exist because of variations in urban governance structures throughout the continent. However, even in highly decentralised states, such as South Africa, which is recognised as a good practice for devolution, national politics, policies and funding strongly influences smart urbanism initiatives (INT.09). Smart urbanism is shaped and filtered through a complex weave of national and municipal governance arrangements (Boyle et al., 2023), making it multi-scalar and intrinsically connected to wider policy scales (Cinnamon, 2023).

Smart urbanism practices are also inhibited by the nesting of public authorities within wider metropolitan regions, where urbanisation dynamics outpace any attempt at institutional restructuring. To control the spatial expansion of urban agglomerations, national governments have reshaped municipal boundaries and created metropolitan authorities. However, these new administrative entities are provided with weak coordinating authority, which is frequently bypassed by their constitutive municipalities or the national government itself (Bannister & Sutcliffe, 2019). For example, in Nigeria, the megacity of Lagos was split into 20 local government authorities (LGAs) spanning two federal states. This division has posed critical coordination challenges: citywide policy and strategy formulation would require dialogue between LGAs subject to different state-defined policies and regulatory frameworks (UN-HABITAT, 2018). Conversely, in Kenya, constitutional reforms have introduced highly decentralised and spatially extensive counties. Municipal governments were eliminated, hampering the effective management of city-level operations (Bassett, 2016).

Within metropolitan and municipal entities, understanding decision-making related to smart urbanism requires examining dialogue and cooperation among elected leaders as well as the interactions between politicians and bureaucrats. In particular, effective urban service delivery can be largely shaped by the degree of separation between the political and bureaucratic spheres and the degree of autonomy bureaucrats face in implementing their responsibilities (Dasandi & Esteve, 2017). For example, Boyle et al. (2023) detailed how the digital strategy of Cape Town was shaped by the strong political interference of the mayor's office over administrative branches, which undermined the competence and autonomy of public officials, causing frustration, resignations and fragmentation among departments.

Institutional arrangements in the African territorial system are further complicated by the unclear functional interrelations between urban and rural areas. Research has demonstrated that the flows of people, goods, labour and capital moving across urban areas and rural environments have blurred their boundaries (Agergaard & Ortenbjerg, 2017). This difficulty in dividing urban settings from their hinterlands is also exacerbated by the wider socioeconomic changes that new global connectivity has brought about – money transfers, the proliferation of smartphones and mobile Internet, to name a few (Muto, 2012). This reading of urban–rural fluidity within digital transitions calls for a deeper reflection on the geographic scope of current theories on the governance of smart urbanism.

3. URBAN INNOVATION ECOSYSTEM

Theorising smart urbanism suggests that the governance of urban innovation processes requires organising cross-sector collaborations that connect public organisations to businesses, research institutions, civil society organisations and citizens (Mora & Deakin, 2019; Vallance et al., 2020). Research on these collaborations, which enact 'complex interactions between multiple stakeholders operating at different levels of governance' (Knox & Arshed, 2022, p. 1161) has positioned regional-level ecosystem theories into smart urbanism studies, leading to concepts like *stakeholder constellations* (Mello Rose, 2022) and *urban*

innovation ecosystems (Camboim et al., 2019). However, extant theories on collaboration in smart urbanism do not consider that the fragmentation of African public action requires focusing on additional actors and distinct forms of intervention (Devas, 2001; Smit, 2018). However, the influence of these factors on urban digital transformation remains unexplored.

First, compared with other regions of the world, traditional and informal authorities play a significant role in local African communities, especially in urban fringes, transition spaces and rural environments. They have recognised responsibilities for key governance matters and significant decision-making power and operate as hybrid organisations positioned at the intersection between civil society and the public sector (Meth et al., 2021). For example, while examining the governance of urbanisation processes in South Africa and Tanzania, Beall et al. (2015) and Schlimmer (2022) described how municipal and central governments need to constantly negotiate and mediate power over land management and basic service provision with village councils and chiefs. Similarly, Ameyaw and De Vries (2021) showed that the implementation of a blockchain-based digital land registry in Ghana has become a matter of authority negotiation between traditional rural elites and formal political bodies.

Second, African regions are characterised by a dynamic migratory profile, with many groups maintaining a high degree of mobility (Cottyn et al., 2013). With a strong emphasis on the local dimension and proximity conditions shaping urban innovation ecosystems, current smart urbanism theories fail to account for transnational communities and their effects on entrepreneurial activities. Technological advancements related to cheaper transportation and real-time communication have enabled the move from a static diaspora, settling in a new country while maintaining ties to their homeland, to cohesive transnational communities that are active in multiple countries. This change has triggered transnational entrepreneurship: cross-border business ventures that rely on multiple 'cultural, institutional and economic features' (Zapata-Barrero & Rezaei, 2020, p. 1960). Telecommunications and digital technologies are often at the core of such businesses and are essential for enabling and promoting them in a feedback loop (Houngbonon et al., 2022). Transnational entrepreneurs operate in local innovation ecosystems, but they work as external actors with internal insight and agency, entrenching a strong competitive position in environments characterised by weak institutions and difficult business environments (Ojo et al., 2013). In the Horn of Africa, for instance, transnational businesses are indicated as a stabilising force and provide public services in sectors where a legitimate government is lacking (Meester et al., 2019). Additionally, transnational entrepreneurship facilitates the cross-national diffusion of technological competencies, skills and social–cultural capital acquired by migrants (Hübler, 2016; Oiarzabal & Reips, 2012), while influencing home country policies (Kshetri, 2013).

Third, the influence of donors such as philanthropies, international agencies, and governmental and non-governmental organisations in developing regions means that African smart urbanism is often shaped by a combination of coercive, normative and mimetic forces (DiMaggio & Powell, 1983). Donors push African countries towards innovation-driven development (Denis, 2021), but resource dependency creates coercive pressure to implement administrative reforms, procurement practices and service provision modalities that align with the preferences of funding agents (Andrews, 2012). When designing smart urbanism projects, many African cities ask themselves, 'Which donor will be involved? Which kind of agenda? What is its interest? It is not about local and national strategy; it is about hype, money, and opportunities' (INT.07). Simultaneously, funding agencies tend to impose norms and standards for smart urbanism set by global market forces and internationally claimed best practices (Joss et al., 2019). When faced with this imposition, local communities tend to replicate predominant practices and behaviours without local-level assimilation and place-based adaptation (Manda & Backhouse, 2019). This pressure aggravates the consequences of what can be considered a mimicking effect. African cities tend to imitate successful examples drawn from global imaginaries of urban modernity to solve existing urban planning issues and fulfil their aspirations to be recognised as innovative and cosmopolitan places. Watson (2014) describes these 'African urban fantasies' and their alluring rhetoric as one of the most dangerous phenomena in African urbanisation.

Finally, a relevant proportion of citizens are excluded from the opportunities brought about by smart urbanism due to factors such as poverty, illiteracy, marginalisation and limited access to digital technology (OECD et al., 2022). Questions on power dynamics, inequality and injustice across levels of society have only been marginally examined, despite being of utmost importance in Africa (Fuchs & Horak, 2008; Odendaal, 2023). More clarity is needed on how to level these benefits with a broader audience and engage these marginalised populations in co-design processes (INT.06). In addition, the digital divide in African countries has a territorial component (Furuholt & Kristiansen, 2007; Pick & Sarkar, 2015). This distinctive attribute derives from a high level of urban primacy. Most of the urban population and central political powers are concentrated in a few main cities that receive the largest and disproportionate shares of resources and infrastructure provision (Cities Alliance & AfDB, 2022). African secondary cities and their inhabitants suffer from huge infrastructural, technological and governance gaps, the correlation of which with smart urbanism practices has been neglected in research and policy development (Ranchod, 2020).

4. URBAN TECHNOLOGICAL INFRASTRUCTURE

The backbone of smart urbanism is urban technological infrastructure that combines digital services and applications with data, software and hardware components

(Mora et al., 2021). For many scholars, the very notion of smart urbanism is a constantly expanding network of ubiquitous sensors and other digital devices built into the urban fabric (Greenfield, 2006; Kitchin, 2014). However, this idea of the gradual, linear and widespread growth of the technological layer and its deployment contrasts with the social fragmentation and splintered spatiality of African cities and regions (Guma & Monstadt, 2021). There is a vast and overlooked divide between how technological infrastructure is planned, promoted, and perceived, and how it is implemented, owned and accessed.

Government authorities in Africa tend to promote smart urbanism plans and strategies anchored to hypermodernist visions that are translated into new towns by processes of 'utopian speculative urbanism' (Cairns et al., 2022). The best-known examples of smart urbanism projects on the continent, from Konza in Kenya to Hope City in Ghana, promise to solve Africa's urbanisation challenges through satellite city developments infused with cutting-edge digital technology. Not only are these projects generally incapable of meeting their claims (Arku et al., 2022), but they also show no connection with the ordinary realities of African communities (Guma & Monstadt, 2021; Watson, 2014). The technological infrastructure that builds the foundations of these developments and the human capital needed to appropriate them represent a reality only in a limited number of geographical locations within the continent (Watson, 2015). These experiences have become exemplary cases of African smart urbanism thanks to international debates. However, they offer only a partial understanding of current practices. What remains invisible in the extant literature is an 'actually existing' (Shelton et al., 2015, p. 13) landscape of more dispersed and multifaced urban digital developments that have proved to respond to local development needs better than projects inspired by utopian thinking. Overlooking these practices leads to a misleading understanding of smart urbanism in Africa.

Most of these practices did not emerge from speculative, top-down city plans. Rather, they are the products of social entrepreneurship activities mediated through ground-level negotiations within collaborative ecosystems, the objective of which is to deliver basic public services (Guma & Monstadt, 2021). These approaches to smart urbanism also reflect the uneven development and splintering spatiality of African cities and regions. Technology-based systems of service delivery are scarcely integrated among themselves, and they often target specific urban niches or clusters instead of being available citywide (Guma, 2019). These bespoke digitally rendered services appear to mirror and intensify socio-spatial inequalities (Odendaal, 2011) while allowing decentralised systems to coexist and serve specific user segments that would otherwise be neglected (van Welie et al., 2018).

This approach to smart urbanism demonstrates a rethinking of the general assumptions related to what urban technological infrastructure should be envisaged; there is more than advanced and emerging technology. Urban technological infrastructure does not always require advanced, expensive, or highly experimental technological devices. Smart urbanism can also be generated through readily available and relatively unsophisticated applications (United Nations Conference on Trade and Development (UNCTAD), 2022). Mobile money applications, such as the Kenyan *mPesa*, which rely on low technology such as mobile phones and their short message services, and unstructured supplementary service data are examples of frugal innovations with deep transformative effects (Tiwari & Kalogerakis, 2016). They provide critical financial services to individuals who lack access to formal financial services and modern technologies (David-West et al., 2019). Mobile money is now a standard in resource-poor settings worldwide and wider population segments choose (or are forced to use) these systems. In fragile contexts such as Somalia, this technology has bypassed the challenges of currency depreciation crises and transitioned to an almost cashless economy. Typically, by recognising the benefits offered by these services, aid agencies attempt to increase their diffusion by distributing mobile phones and SIM cards loaded with mobile money to displaced communities. Due to this process, a larger number of displaced individuals can maintain economic ties with their global diaspora through remittances, which have long been vital to the wider economy of the region (Chonka & Bakonyi, 2021).

These overlooked digital developments reflect the ability of African cities to adapt, contextualise, and expand foreign technologies while launching less advanced but disruptive innovations that mobilise dynamic and complex sociotechnical development processes (Odendaal, 2022). Exemplary cases include digital metres for energy and water provision in Mozambique and Kenya (Baptista, 2015; Guma, 2019). They have been used by utility companies to expand their markets while improving accessibility and affordability, especially in informal neighbourhoods. Similarly, already available mobility apps have been adapted to serve informal public transport systems composed of a wide range of vehicles, such as taxis, minibuses, motorcycles and auto rickshaws. These apps have proven to promote safety for both drivers and customers, regularise payment transactions and support job creation (Odendaal, 2022).

Several examples of smart urbanism projects also show how the aspirational desire of project partners swings from ambitions of modernity and profit-oriented interests to pro-poor intentions. With the help of local communities, geospatial information technologies and digital land management systems have been introduced in the urban fringes of countries such as Rwanda, Uganda, Benin, Kenya and Nigeria. These technologies help map informal settlements and make them visible (Kamalipour & Dovey, 2019) while ensuring that a variety of informal and customary land rights are acknowledged (Arko-Adjei & Akrof, 2019). In Gambia, the government partnered with Google to introduce *+codes* and to provide a digital address system throughout the Greater Banjul region. The broader ambition is to equip the country with a mapping and positionality infrastructure that is foundational for the uses and services of a globalising digital economy (INT.02).

5. PROBLEMATISING SMART URBANISM IN AFRICA

Regional studies have long been aware of the limited capability of the existing theory to explain the southern urban experience and have already underlined the need to strengthen theory-building efforts (Ernstson et al., 2014; Robinson, 2002; Roy, 2009). The discussion of smart urbanism needs to account for this wider framing context. Our critical analysis reveals that several constructs that frame the smart urbanism theory do not apply properly to African cities. These incompatibilities can be synthesised into three main research questions (RQs) connected to established areas of enquiry in urban and regional studies. Their investigation can help expand our knowledge of smart urbanism.

> *RQ: How can we complement the city-level orientation of smart urbanism research with a stronger focus on territorial governance?*

Some research efforts have been put into finding 'the right scale of governance' (Herrschel, 2013) and operationalising city-region approaches (Kitchin & Moore-Cherry, 2021), but further research is needed to understand how administrative and geographical arrangements impede or facilitate smart urbanism practices at different scales. This is especially important in African cities, where traditional administrative hierarchies and multiscale governance fail to respond to urbanisation dynamics (Watson, 2021). Smart urbanism in Africa needs to be understood in terms of the complexity of vertical and horizontal institutional relations: in the conflicts, overlaps and grey areas of devolved administrative functions; in the misalignment between devolved functions and the financial means to achieve them; and in the interplay between cities, territories, and their local and national governments. In this context, urban and regional studies have sought new concepts for these distinct modes of space production, and the resulting disparate state structures and non-linear government arrangements (Caldeira, 2017; Meth et al., 2021; Schmid et al., 2018). Emerging territorial concepts seem more suitable for analysing and theorising African smart urbanism, but they have little to no recognition in the smart urbanism literature addressing African cities. Examples of these concepts include smart territory, a term which addresses the digital divide between urban and rural areas while promoting local opportunities (Navío-Marco et al., 2020), and digital nations, which involves a comprehensive approach to nationwide digital transformation (Kar et al., 2019).

> *RQ: Who is involved and excluded in agenda setting and prioritisation, and how?*

Given the heterogeneous ecosystem of non-state actors involved in the governance of African cities, detailed insights into their single agency are needed concerning how they interact with the political and contested nature of contemporary urban and regional spaces (Lindell, 2008). Place leadership and a collaborative governance lens (Beer et al., 2019; Sotarauta et al., 2017) could help recognise the level of leadership dispersion (Hambleton, 2015) and map how resources – knowledge, human and organisational – are distributed across different actors in Africa's societal sectors and segments of space (Grillitsch & Sotarauta, 2020). This is an essential step in understanding the roles of individual actors in driving change and determining the extent to which they can form coalitions of interest to sustain smart urbanism practices (Nicholds et al., 2017). In particular, the micropolitical dynamics of local arrangements, governance practices and power relations (Sotarauta, 2017) could reveal the mechanisms by which largely invisible individuals and groups participate in path creation and development (Hutchinson & Eversole, 2022) and day-to-day administration and politics (Drivdal, 2016). Moreover, crucial to understanding the socioeconomic coordination issues arising between actors is the need to embrace dimensions of proximity beside the geographical one (Boschma, 2005; Torre & Rallet, 2005). As African cities become increasingly wired to their regions and a globalised world, the resulting networks of mobility and migration on one side and donor assistance on the other make the place-based development strategies of cities and regions a complex process spanning across geographical boundaries (Cortinovis & van Oort, 2022).

> *RQ: How is technology infrastructure embedded in uneven urban environments?*

Africa's digital infrastructure is integrated into multiple aspects of urban and regional dynamics. However, the ownership of this infrastructure, the nature of the technologies themselves, and their unequal distribution and utilisation reflect a dynamic and contested spatiality and an uneven landscape of innovations and smart users. The extant literature on urban and regional studies has problematised urban infrastructure and its deployment (Glass et al., 2019; Wiig & Silver, 2019) by examining how the provision of technology often fragments urban spaces (Graham & Marvin, 2001) and by highlighting how people reformulate urban geographies through informal, incremental appropriation (Rao, 2014; Simone, 2004). The challenges and potential of smart urbanism in Africa cannot be addressed without similar changes in thinking. Research needs to reconcile different conceptions of smartness, multiple ways of engaging with and understanding the technology, and balance locally defined uses of smartness and the specific socio-spatial relations in which usage takes place.

6. CONCLUSIONS

We recognise the need for radical change in the approach to provincialising the smart urbanism theory. Urban and regional studies are unclear as to which core assumptions of governance frameworks for smart urbanism projects

should be adjusted to align with the multifaceted complexity of regional conditions. What is overlooked is that urban transformations are 'stubbornly local affairs' (Grandin & Haarstad, 2021, p. 296) that depend on local factors such as local agency, political negotiation and material change (Peck & Theodore, 2015) and extant theories require adaptation to changing conditions before being mobilised (McCann et al., 2013; Peck, 2015). Clarity is also missing around the lines of enquiry we should pursue to support these region-focused theory developments.

This article articulates this critique by focusing on the distinctive attributes of African urban environments. Core assumptions in mainstream smart urbanism theory are presented, and their validity is examined on the African continent by drawing on a diverse range of scholarship on urban and regional studies. Based on this analysis, we formulated three main research questions that future academic contributions should consider. However, it is important to highlight that these questions are not exclusive to Africa; they can also help trigger research offering theoretical adjustments in other geographical contexts.

In line with the remarks made in recent studies, we acknowledge that relationality and comparability are key components of a smart urbanism research agenda that calls for decentring and decolonialising the dominant interpretations of smartness and digital transition that only build upon the experiences of cities located in Western, industrialised and wealthy countries (Miller et al., 2021). Moving beyond overly generalised theories of smart urbanism requires an understanding of how transformations are negotiated within and across multiple geographically dispersed settings and sensitivity to the need for mutual adaptation that links policy mobility practices to regional context conditions (McCann & Ward, 2011). This means employing comparative approaches that 'seek to understand the systemic and political processes at play' and open 'new spaces for thinking about what smartness means, how it operates, and its attendant implications' (Burns et al., 2021, p. 467) across regions.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

FUNDING

This study was supported by the European Commission through the Horizon 2020 project FinEst Twins [grant agreement number 856602]. Additional funding was also provided by the United Nations Human Settlements Programme and CAF – Development Bank of Latin America, in the framework of the projects Digital Governance in Cities [reference number CFP/2-2022-DGF] and Exploratory Study of Governance Models for Smart Cities.

NOTE

1. Direct quotations extracted from interviews are referenced with a code directly connected to Appendix A online. Oral consent to reuse these data for publication purposes was obtained from all participants and recorded while conducting the interviews.

ORCID

Francesco Tonnarelli http://orcid.org/0000-0003-2365-945X
Luca Mora http://orcid.org/0000-0003-4680-6985

REFERENCES

Acuto, M. (2013). City leadership in global governance. *Global Governance: A Review of Multilateralism and International Organizations*, *19*(3), 481–498. https://doi.org/10.1163/19426720-01903008

African Union Commission. (2015). *Agenda 2063: The Africa we want*. African Union.

African Union Commission. (2020). *The digital transformation strategy for Africa (2020–2030)*. African Union.

Agergaard, J., & Ortenbjerg, S. B. (2017). Urban transformations and rural–city connections in Africa. *Geografisk Tidsskrift – Danish Journal of Geography*, *117*(2), 63–67. https://doi.org/10.1080/00167223.2017.1367698

Ahmad, J., Devarajan, S., Khemani, S., & Shah, S. (2005). *Decentralization and service delivery* (Policy Research Working Paper No. 3603). World Bank. https://openknowledge.worldbank.org/handle/10986/8933

Ameyaw, P. D., & De Vries, W. T. (2021). Toward smart land management: Land acquisition and the associated challenges in Ghana. A look into a blockchain digital land registry for prospects. *Land*, *10*(3), 239. https://doi.org/10.3390/land10030239

Andrews, M. (2012). The logical limits of best practice administrative solutions in developing countries. *Public Administration and Development*, *32*(2), 137–153. https://doi.org/10.1002/pad.622

Arko-Adjei, A., & Akrof, E. O. (2019). *Customary land tenure security: Tools and approaches in Sub-Saharan Africa (a synthesis report)*. UN-HABITAT.

Arku, R. N., Buttazzoni, A., Agyapon-Ntra, K., & Bandauko, E. (2022). Highlighting smart city mirages in public perceptions: A twitter sentiment analysis of four African smart city projects. *Cities*, *130*, 103857. https://doi.org/10.1016/j.cities.2022.103857

Aurigi, A., & Odendaal, N. (2021). From 'smart in the box' to 'smart in the city': Rethinking the socially sustainable smart city in context. *Journal of Urban Technology*, *28*(1–2), 55–70. https://doi.org/10.1080/10630732.2019.1704203

Bandauko, E., & Nutifafa Arku, R. (2023). A critical analysis of 'smart cities' as an urban development strategy in Africa. *International Planning Studies*, *28*, 69–86. https://doi.org/10.1080/13563475.2022.2137112

Bannister, S., & Sutcliffe, M. (2019). *African metropolitan report*. Metropolis. https://www.metropolis.org/sites/default/files/resources/african-metropolitan-reoprt.pdf

Baptista, I. (2015). 'We live on estimates': Everyday practices of prepaid electricity and the urban condition in Maputo, Mozambique. *International Journal of Urban and Regional Research*, *39*(5), 1004–1019. https://doi.org/10.1111/1468-2427.12314

Bassett, E. (2016). Urban governance in a devolved Kenya. In C. N. Silva (Ed.), *Governing urban Africa* (pp. 73–98). Palgrave Macmillan. https://doi.org/10.1057/978-1-349-95109-3_3

Beall, J., Parnell, S., & Albertyn, C. (2015). Elite compacts in Africa: The role of area-based management in the new governmentality of the Durban city-region. *International Journal of Urban and Regional Research*, *39*(2), 390–406. https://doi.org/10.1111/1468-2427.12178

Beer, A., Ayres, S., Clower, T., Faller, F., Sancino, A., & Sotarauta, M. (2019). Place leadership and regional economic development: A framework for cross-regional analysis. *Regional Studies*, *53*(2), 171–182. https://doi.org/10.1080/00343404.2018.1447662

Boschma, R. (2005). Proximity and innovation: A critical assessment. *Regional Studies*, *39*(1), 61–74. https://doi.org/10.1080/0034340052000320887

Boyle, L., Harlow, J., & Keeler, L. W. (2023). (D)evolving smartness: Exploring the changing modalities of smart city making in Africa. *Urban Geography*, 1–25. https://doi.org/10.1080/02723638.2023.2213035

Broadband Commission. (2019). *Connecting Africa through broadband*. https://broadbandcommission.org/working-groups/digital-infrastructure-moonshot-for-africa/

Bulkeley, H., & Betsill, M. (2005). Rethinking sustainable cities: Multilevel governance and the 'urban' politics of climate change. *Environmental Politics*, *14*(1), 42–63. https://doi.org/10.1080/0964401042000310178

Burns, R., Fast, V., Levenda, A., & Miller, B. (2021). Smart cities: Between worlding and provincialising. *Urban Studies*, *58*(3), 461–470. https://doi.org/10.1177/0042098020975982

Cairns, R., Onyango, J., Stirling, A., & Johnstone, P. (2022). Imagining urban transformation in Kenya. *Environmental Science & Policy*, *135*, 86–95. https://doi.org/10.1016/j.envsci.2022.04.016

Caldeira, T. P. (2017). Peripheral urbanization: Autoconstruction, transversal logics, and politics in cities of the global south. *Environment and Planning D: Society and Space*, *35*(1), 3–20. https://doi.org/10.1177/0263775816658479

Camboim, G. F., Zawislak, P. A., & Pufal, N. A. (2019). Driving elements to make cities smarter: Evidences from European projects. *Technological Forecasting and Social Change*, *142*, 154–167. https://doi.org/10.1016/j.techfore.2018.09.014

Chonka, P., & Bakonyi, J. (2021). Precarious technoscapes: Forced mobility and mobile connections at the urban margins. *Journal of the British Academy*, *9*(s11), 67–91. https://doi.org/10.5871/jba/009s11.067

Ciasullo, M. V., Troisi, O., Grimaldi, M., & Leone, D. (2020). Multi-level governance for sustainable innovation in smart communities: An ecosystems approach. *International Entrepreneurship and Management Journal*, *16*(4), 1167–1195. https://doi.org/10.1007/s11365-020-00641-6

Cinnamon, J. (2023). On data cultures and the prehistories of smart urbanism in 'Africa's digital city'. *Urban Geography*, *44*(5), 850–870. https://doi.org/10.1080/02723638.2022.2049096

Cities Alliance & African Development Bank (AfDB). (2022). *Dynamics of systems of secondary cities in Africa*. AfDB. https://www.afdb.org/sites/default/files/2022/05/16/the_dynamics_of_systems_of_secondary_cities_in_africa_urbanisation_migration_and_development_-_2022.pdf

Clement, J., Manjon, M., & Crutzen, N. (2022). Factors for collaboration amongst smart city stakeholders: A local government perspective. *Government Information Quarterly*, *39*(4), 101746. https://doi.org/10.1016/j.giq.2022.101746

Cohen, B. (2006). Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in Society*, *28*(1), 63–80. https://doi.org/10.1016/j.techsoc.2005.10.005

Cortinovis, N., & van Oort, F. (2022). Economic networks, innovation and proximity. In A. Torre & D. Gallaud (Eds.), *Handbook of proximity relations* (pp. 292–306). Edward Elgar.

Cottyn, I., Schapendonk, J., & van Lindert, P. (2013). *Mobility in SubSaharan Africa: Patterns, processes and policies* (RurbanAfrica State of the Art Number 2). University of Copenhagen.

Croese, S., Oloko, M., Simon, D., & Valencia, S. C. (2021). Bringing the global to the local: The challenges of multi-level governance for global policy implementation in Africa. *International Journal of Urban Sustainable Development*, *13*(3), 435–447. https://doi.org/10.1080/19463138.2021.1958335

Cupers, K., & Meier, P. (2020). Infrastructure between statehood and selfhood: The trans-African highway. *Journal of the Society of Architectural Historians*, *79*(1), 61–81. https://doi.org/10.1525/jsah.2020.79.1.61

Dasandi, N., & Esteve, M. (2017). The politics–bureaucracy interface in developing countries. *Public Administration and Development*, *37*(4), 231–245. https://doi.org/10.1002/pad.1793

Datta, A. (2015). New urban utopias of postcolonial India: 'Entrepreneurial urbanization' in Dholera smart city. *Gujarat. Dialogues in Human Geography*, *5*(1), 3–22. https://doi.org/10.1177/2043820614565748

David-West, O., Iheanachor, N., & Umukoro, I. O. (2019). Mobile money as a frugal innovation for the bottom of the pyramid – Cases of selected African countries. *Africa Journal of Management*, *5*(3), 274–302. https://doi.org/10.1080/23322373.2019.1652023

Denis, B. (2021). *The rise of Africa's digital economy*. European Investment Bank.

Devas, N. (2001). Does city governance matter for the urban poor? *International Planning Studies*, *6*(4), 393–408. https://doi.org/10.1080/13563470120092395

Devas, N. (2003). Can city governments in the south deliver for the poor: A municipal finance perspective. *International Development Planning Review*, *25*(1), 1–29. https://doi.org/10.3828/idpr.25.1.1

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*(2), 147–160. https://doi.org/10.2307/2095101

Drivdal, L. (2016). Community leadership in urban informal neighbourhoods: Micro-politics and micro-administration in informal settlements in Cape Town. *Urban Forum*, *27*(3), 275–295. https://doi.org/10.1007/s12132-016-9289-5

Ehnert, F., Kern, F., Borgström, S., Gorissen, L., Maschmeyer, S., & Egermann, M. (2018). Urban sustainability transitions in a context of multi-level governance: A comparison of four European states. *Environmental Innovation and Societal Transitions*, *26*, 101–116. https://doi.org/10.1016/j.eist.2017.05.002

Ernstson, H., Lawhon, M., & Duminy, J. (2014). Conceptual vectors of African urbanism: 'engaged theory-making' and 'platforms of engagement'. *Regional Studies*, *48*(9), 1563–1577. https://doi.org/10.1080/00343404.2014.892573

Fox, S. (2014). The political economy of slums: Theory and evidence from Sub-Saharan Africa. *World Development*, *54*, 191–203. https://doi.org/10.1016/j.worlddev.2013.08.005

Fuchs, C., & Horak, E. (2008). Africa and the digital divide. *Telematics and Informatics*, *25*(2), 99–116. https://doi.org/10.1016/j.tele.2006.06.004

Furuholt, B., & Kristiansen, S. (2007). A rural–urban digital divide? *The Electronic Journal of Information Systems in Developing Countries*, *31*(1), 1–15. https://doi.org/10.1002/j.1681-4835.2007.tb00215.x

Glass, M. R., Addie, J.-P. D., & Nelles, J. (2019). Regional infrastructures, infrastructural regionalism. *Regional Studies*, *53*(12), 1651–1656. https://doi.org/10.1080/00343404.2019.1667968

Graham, S., & Marvin, S. (2001). *Splintering urbanism*. Routledge. https://doi.org/10.4324/9780203452202

Grandin, J., & Haarstad, H. (2021). Transformation as relational mobilisation: The networked geography of Addis Ababa's sustainable transport interventions. *Environment and Planning D: Society and Space*, *39*(2), 289–308. https://doi.org/10.1177/0263775820963281

Greenfield, A. (2006). *Everyware: The dawning age of ubiquitous computing*. New Riders.

Grillitsch, M., & Sotarauta, M. (2020). Trinity of change agency, regional development paths and opportunity spaces. *Progress in Human Geography*, *44*(4), 704–723. https://doi.org/10.1177/0309132519853870

Guma, P. K. (2019). Smart urbanism? ICTs for water and electricity supply in Nairobi. *Urban Studies*, *56*(11), 2333–2352. https://doi.org/10.1177/0042098018813041

Guma, P. K., & Monstadt, J. (2021). Smart city making? The spread of ICT-driven plans and infrastructures in Nairobi. *Urban Geography*, *42*(3), 360–381. https://doi.org/10.1080/02723638.2020.1715050

Hambleton, R. (2015). Place-based collaboration: Leadership for a changing world. *Administration*, *63*(3), 5–25. https://doi.org/10.1515/admin-2015-0018

Herrschel, T. (2013). Competitiveness and sustainability: Can 'smart city regionalism' square the circle? *Urban Studies*, *50*(11), 2332–2348. https://doi.org/10.1177/0042098013478240

Hodson, M., & Marvin, S. (2010). Can cities shape socio-technical transitions and how would we know if they were? *Research Policy*, *39*(4), 477–485. https://doi.org/10.1016/j.respol.2010.01.020

Houngbonon, G. V., Mensah, J. T., & Traore, N. (2022). *The impact of internet access on innovation and entrepreneurship in Africa*. World Bank. http://hdl.handle.net/10986/37059

Hutchinson, D., & Eversole, R. (2022). Local agency and development trajectories in a rural region. *Regional Studies*, 1–12. https://doi.org/10.1080/00343404.2022.2108543

Hübler, M. (2016). Does migration support technology diffusion in developing countries? *World Development*, *83*, 148–162. https://doi.org/10.1016/j.worlddev.2016.01.024

Joss, S., Sengers, F., Schraven, D., Caprotti, F., & Dayot, Y. (2019). The smart city as global discourse: Storylines and critical junctures across 27 cities. *Journal of Urban Technology*, *26*(1), 3–34. https://doi.org/10.1080/10630732.2018.1558387

Kamalipour, H., & Dovey, K. (2019). Mapping the visibility of informal settlements. *Habitat International*, *85*, 63–75. https://doi.org/10.1016/j.habitatint.2019.01.002

Kar, A. K., Ilavarasan, V., Gupta, M. P., Janssen, M., & Kothari, R. (2019). Moving beyond smart cities: Digital nations for social innovation & sustainability. *Information Systems Frontiers*, *21*(3), 495–501. https://doi.org/10.1007/s10796-019-09930-0

Keating, M. (2017). Contesting European regions. *Regional Studies*, *51*(1), 9–18. https://doi.org/10.1080/00343404.2016.1227777

Kitchin, R. (2014). The real-time city? Big data and smart urbanism. *GeoJournal*, *79*(1), 1–14. https://doi.org/10.1007/s10708-013-9516-8

Kitchin, R., & Moore-Cherry, N. (2021). Fragmented governance, the urban data ecosystem and smart city-regions: The case of metropolitan Boston. *Regional Studies*, *55*(12), 1913–1923. https://doi.org/10.1080/00343404.2020.1735627

Knox, S., & Arshed, N. (2022). Network governance and coordination of a regional entrepreneurial ecosystem. *Regional Studies*, *56*(7), 1161–1175. https://doi.org/10.1080/00343404.2021.1988067

Kshetri, N. (2013). The diaspora as a change agent in entrepreneurship-related institutions in sub-Saharan Africa. *Journal of Developmental Entrepreneurship*, *18*(3), 1350021. https://doi.org/10.1142/S1084946713500210

Lawhon, M. (2012). Contesting power, trust and legitimacy in the South African e-waste transition. *Policy Sciences*, *45*(1), 69–86. https://doi.org/10.1007/s11077-012-9146-x

Lindell, I. (2008). The multiple sites of urban governance: Insights from an African city. *Urban Studies*, *45*(9), 1879–1901. https://doi.org/10.1177/0042098008093382

Mancebo, F. (2020). Smart city strategies: Time to involve people. Comparing Amsterdam, Barcelona and Paris. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, *13*(2), 133–152. https://doi.org/10.1080/17549175.2019.1649711

Manda, M. I., & Backhouse, J. (2019). Smart governance for inclusive socio-economic transformation in South Africa: Are we there yet? In M. P. Rodríguez Bolívar & L. Alcaide Muñoz (Eds.), *e-Participation in smart cities: Technologies and models of governance for citizen engagement* (pp. 179–201). Springer . https://doi.org/10.1007/978-3-319-89474-4_9

Marvin, S., Luque-Ayala, A., & McFarlane, C. (Eds.). (2016). *Smart urbanism – Utopian vision or false dawn?* Routledge.

McCann, E., Roy, A., & Ward, K. (2013). Assembling/worlding cities. *Urban Geography*, *34*(5), 581–589. https://doi.org/10.1080/02723638.2013.793905

McCann, E., & Ward, K. (2011). Urban assemblages: Territories, relations, practices, and power. In E. McCann, & K. Ward (Eds.), *Mobile urbanism – Cities and policymaking in the global Age* (pp. xiii–xxxiii). Minnesota University Press.

Meester, J., Uzelac, A., & Elder, C. (2019). *Transnational capital in Somalia*. Clingendael Institute. https://www.clingendael.org/publication/transnational-capital-somalia

Mello, L. d., & Ter-Minassian, T. (2020). *Digitalisation challenges and opportunities for subnational governments* (OECD Working Papers on Fiscal Federalism Number 31). Organisation for Economic Co-operation and Development (OECD).

Mello Rose, F. (2022). Activity types, thematic domains, and stakeholder constellations: Explaining civil society involvement in Amsterdam's smart city. *European Planning Studies*, *30*(6), 975–993. https://doi.org/10.1080/09654313.2021.1914556

Meth, P., Goodfellow, T., Todes, A., & Charlton, S. (2021). Conceptualizing African urban peripheries. *International Journal of Urban and Regional Research*, *45*(6), 985–1007. https://doi.org/10.1111/1468-2427.13044

Miller, B., Ward, K., Burns, R., Fast, V., & Levenda, A. (2021). Worlding and provincialising smart cities: From individual case studies to a global comparative research agenda. *Urban Studies*, *58*(3), 655–673. https://doi.org/10.1177/0042098020976086

Mora, L., & Deakin, M. (2019). *Untangling smart cities*. Elsevier. https://doi.org/10.1016/C2017-0-02666-6

Mora, L., Deakin, M., Zhang, X., Batty, M., De Jong, M., Santi, P., & Appio, F. P. (2021). Assembling sustainable smart city transitions: An interdisciplinary theoretical perspective. *Journal of Urban Technology*, *28*(1–2), 1–27. https://doi.org/10.1080/10630732.2020.1834831

Mora, L., Gerli, P., Ardito, L., & Messeni Petruzzelli, A. (2023). Smart city governance from an innovation management perspective: Theoretical framing, review of current practices, and future research agenda. *Technovation*, *123*, 102717. https://doi.org/10.1016/j.technovation.2023.102717

Mouton, M., & Burns, R. (2021). (Digital) neo-colonialism in the smart city. *Regional Studies*, *55*(12), 1890–1901. https://doi.org/10.1080/00343404.2021.1915974

Muto, M. (2012). The impacts of mobile phones and personal networks on rural-to-urban migration: Evidence from Uganda. *Journal of African Economies*, *21*(5), 787–807. https://doi.org/10.1093/jae/ejs009

Myers, G. (2011). *African cities: Alternative visions of urban theory and practice* (1 ed.). Bloomsbury Academic. https://doi.org/10.5040/9781350218123

Navío-Marco, J., Rodrigo-Moya, B., & Gerli, P. (2020). The rising importance of the 'smart territory' concept: Definition and

implications. *Land Use Policy*, *99*, 105003. https://doi.org/10.1016/j.landusepol.2020.105003
Nicholds, A., Gibney, J., Mabey, C., & Hart, D. (2017). Making sense of variety in place leadership: The case of England's smart cities. *Regional Studies*, *51*(2), 249–259. https://doi.org/10.1080/00343404.2016.1232482
Odendaal, N. (2011). Splintering urbanism or split agendas? Examining the spatial distribution of technology access in relation to ICT policy in Durban, South Africa. *Urban Studies*, *48*(11), 2375–2397. https://doi.org/10.1177/0042098010388951
Odendaal, N. (2014). Space matters: The relational power of mobile technologies. *URBE – Revista Brasileira de Gestão Urbana*, *6*(1), 31–45. https://doi.org/10.7213/urbe.06.001.SE02
Odendaal, N. (2021). Everyday urbanisms and the importance of place: Exploring the elements of the emancipatory smart city. *Urban Studies*, *58*(3), 639–654. https://doi.org/10.1177/0042098020970970
Odendaal, N. (2022). Splintering by proxy: A reflection on the spatial impacts and distributed agency of platform urbanism. *Journal of Urban Technology*, *29*(1), 21–27. https://doi.org/10.1080/10630732.2021.2007204
Odendaal, N. (2023). *Disrupted urbanism: Situated smart initiatives in African cities*. Bristol University Press. https://doi.org/10.51952/9781529218596
OECD, UNECA & AfDB. (2022). *Africa's urbanisation dynamics 2022: The economic power of Africa's cities*. Organisation for Economic Co-operation and Development (OECD). https://doi.org/10.1787/3834ed5b-en
Oiarzabal, P. J., & Reips, U.-D. (2012). Migration and diaspora in the age of information and communication technologies. *Journal of Ethnic and Migration Studies*, *38*(9), 1333–1338. https://doi.org/10.1080/1369183X.2012.698202
Ojo, S., Nwankwo, S., & Gbadamosi, A. (2013). African diaspora entrepreneurs: Navigating entrepreneurial spaces in 'home' and 'host' countries. *The International Journal of Entrepreneurship and Innovation*, *14*(4), 289–299. https://doi.org/10.5367/ijei.2013.0126
Parnell, S., & Pieterse, E. (2014). *Africa's urban revolution*. Bloomsbury Academic. https://doi.org/10.5040/9781350218246
Parnell, S., & Walawege, R. (2011). Sub-Saharan African urbanisation and global environmental change. *Global Environmental Change*, *21*, S12–S20. https://doi.org/10.1016/j.gloenvcha.2011.09.014
Peck, J. (2015). Cities beyond compare? *Regional Studies*, *49*(1), 160–182. https://doi.org/10.1080/00343404.2014.980801
Peck, J., & Theodore, N. (2015). *Fast policy: Experimental statecraft at the thresholds of neoliberalism*. University of Minnesota Press.
Pick, J. B., & Sarkar, A. (2015). Digital divide in Africa. In *Progress in IS* (pp. 275–310). Springer. https://doi.org/10.1007/978-3-662-46602-5_9
Pieterse, E. (2018). The politics of governing African urban spaces. *International Development Policy – Revue Internationale de Politique de Développement*, *10*, 26–52. https://doi.org/10.4000/poldev.2626
Ranchod, R. (2020). The data-technology nexus in South African secondary cities: The challenges to smart governance. *Urban Studies*, *57*(16), 3281–3298. https://doi.org/10.1177/0042098019896974
Rao, V. (2014). Infra-city: Speculations on flux and history in infrastructure-making. In S. Graham, & C. McFarlane (Eds.), *Infrastructural lives* (pp. 39–58). Routledge.
Resnick, D. (2021). The politics of urban governance in sub-Saharan Africa. *Regional & Federal Studies*, *31*(1), 139–161. https://doi.org/10.1080/13597566.2020.1774371
Robinson, J. (2002). Global and world cities: A view from off the map. *International Journal of Urban and Regional Research*, *26*(3), 531–554. https://doi.org/10.1111/1468-2427.00397
Rochell, K., Delbridge, V., Harman, O., Zhang, X.-Q., & Fleck, L. (2022). *Financing sustainable urban development*. UN-HABITAT.
Roy, A. (2009). The 21st-century metropolis: New geographies of theory. *Regional Studies*, *43*(6), 819–830. https://doi.org/10.1080/00343400701809665
Schlimmer, S. (2022). Governing cities in Africa: Panorama of challenges and perspectives. *Études de l'Ifri*.
Schmid, C., Karaman, O., Hanakata, N. C., Kallenberger, P., Kockelkorn, A., Sawyer, L., Streule, M., & Wong, K. P. (2018). Towards a new vocabulary of urbanisation processes: A comparative approach. *Urban Studies*, *55*(1), 19–52. https://doi.org/10.1177/0042098017739750
Shelton, T., Zook, M., & Wiig, A. (2015). The 'actually existing smart city'. *Cambridge Journal of Regions, Economy and Society*, *8*(1), 13–25. https://doi.org/10.1093/cjres/rsu026
Simone, A. (2004). People as infrastructure: Intersecting fragments in Johannesburg. *Public Culture*, *16*(3), 407–429. https://doi.org/10.1215/08992363-16-3-407
Slavova, M. & Okwechime, E. (2016). African smart cities strategies for agenda 2063. *Africa Journal of Management*, *2*(2), 210–229. https://doi.org/10.1080/23322373.2016.1175266
Smit, W. (2018). Urban governance in Africa: An overview. *International Development Policy | Revue Internationale de Politique de Développement*, *10*, 55–77. https://doi.org/10.4000/poldev.2637
Sotarauta, M. (2017). An actor-centric bottom-up view of institutions: Combinatorial knowledge dynamics through the eyes of institutional entrepreneurs and institutional navigators. *Environment and Planning C: Politics and Space*, *35*(4), 584–599. https://doi.org/10.1177/0263774X16664906
Sotarauta, M., Beer, A., & Gibney, J. (2017). Making sense of leadership in urban and regional development. *Regional Studies*, *51*(2), 187–193. https://doi.org/10.1080/00343404.2016.1267340
Stren, R. (2012). Cities and politics in the developing world: Why decentralization matters. In P. John, K. Mossberger, & S. E. Clarke (Eds.), *Oxford handbook of urban politics* (pp. 567–589). Oxford University Press.
Su, Y., & Fan, D. (2023). Smart cities and sustainable development. *Regional Studies*, 57(4), 722–738. https://doi.org/10.1080/00343404.2022.2106360
Tao, W. (2013). Interdisciplinary urban GIS for smart cities: Advancements and opportunities. *Geo-spatial Information Science*, *16*(1), 25–34. https://doi.org/10.1080/10095020.2013.774108
Tiwari, R. & Kalogerakis, K. (2016). *A bibliometric analysis of academic papers on frugal innovation* (Working Paper). https://doi.org/10.15480/882.1311
Torre, A., & Rallet, A. (2005). Proximity and localization. *Regional Studies*, *39*(1), 47–59. https://doi.org/10.1080/0034340052000320842
UCLG & Cities Alliance. (2018). *Assessing the institutional environment of local governments in Africa*.
UN-HABITAT. (2018). *Lagos City context report* (Global Future Cities Programme CCR Number 7).
United Nations Conference on Trade and Development (UNCTAD). (2022). *Science, technology and innovation for sustainable urban development in a post-pandemic world*. https://unctad.org/publication/science-technology-and-innovation-sustainable-urban-development-post-pandemic-world
Vallance, P., Tewdwr-Jones, M., & Kempton, L. (2020). Building collaborative platforms for urban innovation: Newcastle city futures as a quadruple helix intermediary. *European Urban and Regional Studies*, *27*(4), 325–341. https://doi.org/10.1177/0969776420905630
van Welie, M. J., Cherunya, P. C., Truffer, B., & Murphy, J. T. (2018). Analysing transition pathways in developing cities:

The case of Nairobi's splintered sanitation regime. *Technological Forecasting and Social Change*, *137*, 259–271. https://doi.org/10.1016/j.techfore.2018.07.059

Watson, V. (2014). African urban fantasies: Dreams or nightmares? *Environment and Urbanization*, *26*(1), 215–231. https://doi.org/10.1177/0956247813513705

Watson, V. (2015). The allure of 'smart city' rhetoric: India and Africa. *Dialogues in Human Geography*, *5*(1), 36–39. https://doi.org/10.1177/2043820614565868

Watson, V. (2021). The return of the city-region in the new urban agenda: Is this relevant in the global south? *Regional Studies*, *55*(1), 19–28. https://doi.org/10.1080/00343404.2019.1664734

Wiig, A., & Silver, J. (2019). Turbulent presents, precarious futures: Urbanization and the deployment of global infrastructure. *Regional Studies*, *53*(6), 912–923. https://doi.org/10.1080/00343404.2019.1566703

Zapata-Barrero, R., & Rezaei, S. (2020). Diaspora governance and transnational entrepreneurship: The rise of an emerging social global pattern in migration studies. *Journal of Ethnic and Migration Studies*, *46*(10), 1959–1973. https://doi.org/10.1080/1369183X.2018.1559990