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RESEARCH ARTICLE

Getting urbanization to work in Africa: the role of the urban land-infrastructure-finance nexus

Ivan Turok

ABSTRACT

The serious social and environmental problems and risks associated with large-scale urbanization in Africa are widely recognized. However, the potential for urbanization to strengthen economic growth and development across the continent has only recently been grasped. The stakes are high for efforts to ensure that urbanization reinforces rather than retards prosperity, yet urban policies are frequently ambivalent and piecemeal. The development trajectory of cities hinges on the quality of their physical foundations, which underpin functional efficiency and will endure for many decades. Realizing the opportunities of urbanization therefore requires more concerted efforts to plan and manage the form of urban growth. This means reformed arrangements governing the allocation and taxation of land, major investment in urban infrastructure and stronger local institutions to coordinate land and property development.

ARTICLE HISTORY

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KEYWORDS

Urbanization, Africa, Land, Infrastructure, Public finance

摘要

与非洲大规模城镇化相关的严重社会、环境问题和风险已得到人们的普遍认同，但城镇化在加强整个非洲经济增长和发展方面的潜力却是在近期才为人们所了解。为确保城镇化对发展起强化而不是阻碍作用付出努力利害重大，但城市政策却往往相互矛盾、零敲碎打。城市的发展轨迹取决于其自身物质基础的质量，这些物质基础支持着其功能运行的效率并且会维持几十年之久。因此，要实现城市化带来的机遇，就需要对城市发展形式的规划和管理做出更多共同的努力与合作。这就意味着需要对土地的分配和税收治理安排进行改革，对城市基础设施进行重大投资，同时加强当地协调土地和房地产开发的制度建设。

关键词

城市化, 非洲, 土地, 基础设施, 公共财政

RESUMEN

En general, se reconocen los graves problemas sociales y medioambientales y los riesgos relacionados con la urbanización a gran escala en África. Sin embargo, solo hasta hace poco se ha comprendido el potencial de la urbanización para reforzar el crecimiento económico y el desarrollo en el continente. Es mucho lo que

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está en juego para garantizar que la urbanización fortalezca y no retrase la prosperidad; no obstante, las políticas urbanas son muchas veces ambivalentes e irregulares. La trayectoria hacia el desarrollo de las ciudades depende de la calidad de sus fundamentos físicos, que potencian la eficiencia funcional y perdurarán durante muchas décadas. Por consiguiente, para aprovechar las oportunidades urbanísticas son necesarios esfuerzos más concertados con el fin de planificar y gestionar la forma del crecimiento urbano. Esto se traduce en programas reformados para poder administrar la asignación y la fiscalidad del suelo, grandes inversiones en infraestructura urbana e instituciones locales más sólidas para coordinar el desarrollo del suelo y la propiedad.

PALABRAS CLAVE

Urbanización, África, Suelo, Infraestructura, Finanzas públicas

АННОТАЦИЯ

Серьезные социальные и экологические проблемы и риски, связанные с масштабной урбанизации в Африке, получили широкое признание. Тем не менее, потенциал урбанизации в укреплении экономического роста и развития на всем континенте был осознан не так давно. Важно добиться, чтобы урбанизация усиливала, а не тормозила рост благосостояния, но городская политика нередко носит довольно неоднозначный характер. Траектории развития городов зависят от качества их физической основы, которые будут определять их функциональную эффективность на протяжении многих десятилетий. Чтобы в полной мере реализовать возможности урбанизации, требуются более согласованные усилия по планированию и управлению ростом городов. Это подразумевает реформирование механизмов, регулирующих распределение и налогообложение земли, крупных инвестиций в городскую инфраструктуру, а также сильные местные институты для координации развития территорий и недвижимости.

КЛЮЧЕВЫЕ СЛОВА

Урбанизация, Африка, Земля, Инфраструктура, Общественные финансы

INTRODUCTION

Approximately 40% of Africa's population currently live in cities and towns. The urban population has grown 14-fold from 32 million in 1950 to over 450 million in 2014 (United Nations, Department of Economic and Social Affairs, Population Division [UNDESA], 2015). It is expected to double over the next two decades and to triple to over 1.3 billion by 2050. This will be the fastest absolute growth in the urban population in the world (UNDESA, 2015). Furthermore, on the basis of current trends, the rate of expansion of the physical footprint of African cities could be half as much again (Angel, 2016; World Bank, 2013). The pressure of demand for land will cause unprecedented enlargement of human settlements so that they cover very extensive territories.¹ Roughly two-thirds of Africa's urban population growth is expected to stem from natural increase and one-third from net rural–urban migration (UNDESA, 2015).

Africa's burgeoning urban population and physical expansion pose daunting challenges for communities, enterprises, ecosystems and governments (African Development Bank [AfDB], 2013; Buckley & Kallergis, 2014; Cartwright, 2015; UN-Habitat, 2014, 2015). A fundamental difficulty is that urbanization is happening at much lower levels of GDP per capita than occurred elsewhere (Jedwab, Christiaensen, & Gindelsky, 2015; Leipziger, Freire, & Lall, 2015; World Bank, 2015). In many African countries, economic progress and job creation have lagged well behind urban population growth for several decades (Henderson, Storeygard, & Deichmann, 2014; Jedwab &

Vollrath, 2015; Onjala & K'Akumu, 2016; UNDESA, 2015). The apparently unproductive character of urban growth has wide-ranging implications for the capacity of governments to finance vital urban infrastructure and public services, and for the ability of households to afford decent and secure housing. The outcome of low income, low investment urbanization includes extensive informal employment, sprawling shack settlements, overloaded services, environmental degradation, social unrest, violent crime and chronic traffic congestion (Collier & Venables, 2015; Myers, 2016; Parnell & Pieterse, 2014; Rossiasco, 2015).

Government urban policies to date have generally been ambivalent and their investments piecemeal, reflecting political reservations about the consequences of urbanization, coupled with institutional weaknesses to provide a more concerted and strategic response (Fox, 2014; Kayizzi-Mugerwa, Shimeles, & Yameogo, 2014; Parnell & Pieterse, 2014; Stren, 2014). The potential for urban growth to support economic development by harnessing the advantages of agglomeration for higher productivity, innovation and enhanced incomes has only recently been recognized in some countries (Turok, 2015; UN-Habitat, 2015). Since Africa is only about halfway through its urban transition, there is a window of opportunity to do things differently by laying the foundations for a better urban future (Collier, 2015). Persistent neglect risks locking in a pattern of sprawling, haphazard urban development that is probably not sustainable—economically, socially or environmentally (UN-Habitat, 2014; World Bank, 2013).

There has been much rhetoric surrounding the positive economic prospects for African cities among international development organizations and think tanks, but few concrete proposals for what should be done to transform conditions. Instead, there have been repeated public pronouncements and declarations from high-level conferences that cities are 'engines of growth' and that urbanization drives economic progress by concentrating people in cities (Global Commission on the Economy and Climate [GCEC], 2014; McKinsey, 2012; Organisation for Economic Cooperation and Development [OECD], 2014; UN-Habitat, 2012). Following the United Nations' new Sustainable Development Goal on Cities, UN-Habitat's New Urban Agenda risks the same formula. The central theme of Habitat III has the bold title: 'The transformative power of urbanisation'. The website declares confidently that 'Throughout modern history, urbanisation has been a major driver of development and poverty reduction' (UN-Habitat, 2016). The practical implications for urban policy and the management of cities remain unclear. UN-Habitat has traditionally focussed on poverty alleviation through slum upgrading, but this failed to garner support from most governments (Buckley & Simet, 2015; Parnell, 2016). There is new interest in how urbanization could boost prosperity, but little idea about how this might be achieved.

Meanwhile, the most noteworthy developments on the ground in many African cities have been a range of real estate projects implemented by international property companies and financial institutions. They include shopping malls, office blocks and residential complexes aimed at the continent's emerging middle class: 'The rapidly growing economies of Africa are catching the attention of increased numbers of property investors' (Knight Frank, 2015, p. 3; see also, Turok, 2013). Controversial plans for new satellite cities, mega-urban projects, privatized precincts and tolled freeways also feature prominently (Cain, 2014; Watson, 2014). Some are already under construction, such as Eko Atlantic in Lagos, Kilamba City in Luanda, Waterfall City in Johannesburg and Kigamboni New City in Dar es Salaam (Grant, 2015; Herbert & Murray, 2015).

Such schemes promise at least a short-term injection of foreign investment, job creation and housing opportunities for regions in urgent need of these resources. They are also sometimes construed as providing a more productive and liveable model of future urban growth. Yet the emphasis is on creating exclusive residential and business districts for higher income groups and overseas investors that bypass the development needs of established cities. The vision appears to be of detached enclaves that disregard everyday urban realities for the vast

majority of citizens. Public consultation, planning and regulation are conspicuously absent from these places, and generous government subsidies and concessionary land disposals may be involved (Cain, 2014; Herbert & Murray, 2015; UN-Habitat, 2015).² There must be better ways of harnessing the new international interest in property development, both to improve the core infrastructure of cities and to devise a more inclusive and sustainable approach to urban expansion.

The main purpose of this article is to consider one of the preconditions for productive and inclusive urban growth. It explores the physical assets and environments that would underpin a more positive and enduring economic outcome from urbanization. These relate to investment in the overall structure and fabric of the city, including its infrastructure networks. The article analyses the proposition that a coherent, compact and connected urban form promotes efficiency and equity. This is unlikely to emerge spontaneously through the operation of market forces and private initiatives. Forms of urban growth that function well depend on collective action through planning ahead, regulating physical development and investing in essential urban infrastructure.

The article is structured as follows. The next section reviews the main theoretical propositions for why urbanization can lead to development. It is important to review the principles before extrapolating the practical implications. The following sections consider how the physical organization of cities can assist or exacerbate economic, social and environmental progress. Three interlinked themes are explored: the governance of land, the provision of urban infrastructure and the financial capabilities of local institutions. The final section outlines an agenda for research on the urban land-infrastructure-finance nexus in Africa and beyond.

URBANIZATION AND AGGLOMERATION

The main reason cities grow and prosper is because agglomeration creates positive value and efficiencies for many kinds of activities (Jacobs, 1969; Melo, Graham, & Noland, 2009; Puga, 2010; Spence, Annez, & Buckley, 2009). Firms, workers and other economic agents that depend on each other for inputs and outputs cluster together in order to save transport costs. Spatial concentration also enables them to specialize around particular products or tasks (a division of labour), which amplifies their capabilities and know-how. Proximity means they can perform complementary functions which generate synergies and efficiencies. They may collaborate, compete, share ideas and learn from each other, which encourages innovation, attracts investment and spurs economic growth and development. The larger the city, the bigger that firms can grow and the greater the scale economies available to lower their unit costs of production. Proximity to many other firms yields additional 'common-pool' resources that improve the performance of firms, such as access to a diverse labour pool, a large customer base and various types of shared infrastructure, including transport and communications.

Specialization also applies at the level of the city, with benefits from focusing on a function, or a set of related functions, and exchanging outputs with other places (Storper, 2013). Specialization becomes more important as transportation technologies improve, costs decline, external trade with other cities grows and competition intensifies. Hence cities do not grow and prosper as entities unto themselves, but through the exchange of products, knowledge and resources with other cities and regions. The long-run growth of national economies depends on an efficient system of urban centres that produce manufactured goods and high value services, linked to each other and to international markets (Leipziger et al., 2015; Spence et al., 2009). National prosperity and spatially balanced development also depend on strong linkages between cities and their rural hinterlands,

involving the supply of food, water, wood, minerals and other primary resources in return for the processed goods and services of the city.

Reciprocal actions between people, firms and other organizations are at the heart of the agglomeration process (Glaeser, 2011; Polese, 2009; Scott & Storper, 2015; World Bank, 2009). The frequency and quality of these interactions influence the economic value generated by geographical concentration. This in turn is influenced by the density and connectivity of activity within the city. For example, commuting patterns are generally more efficient in compact cities than in sprawling settlements. Other economic interactions are the flow of goods and services between firms, and the exchange of information between people. Many additional resource flows affect the long-term viability and growth of cities as well, including water, waste, electricity, traffic and clean air. Their availability and efficient circulation are often taken for granted in discussions of agglomeration, but they depend on the physical capacity and connectivity of expensive infrastructure systems, as well as the density of activity. These physical networks provide the spatial skeleton that supports the location of housing, industry, retailing and public services (Buchanan, 2016; Ingram & Brandt, 2013).

The general point is that urbanization promotes proximity between diverse activities that feed off each other in various ways, creating a highly interconnected and dynamic system with powerful feedback effects on economic development. These interactions are complicated by physical factors, such as the constrained supply of land, the incompatible nature of different land uses and locational rigidities in the built environment (Scott & Storper, 2015). Firms and households seek to locate close to certain types of activity, while avoiding others that impact adversely upon them. Their preferences are conditioned by their ability to pay for land, but are never fully satisfied because the land market operates imperfectly and is slow to adjust to changing conditions through building conversion or redevelopment. There are tensions between the objectives of different types of firm and different households. There is also a tendency for established property owners to oppose more intensive development nearby. In many countries, governments play vital roles in mediating different interests, coordinating different types of investment and guiding the pattern of urban development. Land-use zoning schemes, building regulations, formal property rights and a host of other rules and procedures are created to steer, restrict or align the behaviour of firms and households in line with wider urban objectives. These collective norms and standards also help to generate confidence in the future among investors and prevent costly disputes (Cai, Selod, & Steinbuks, 2015).

The resulting spatial configuration of land uses across the metropolitan area differs enormously from city to city, although some broad regularities can be observed. Buildings are generally tallest and densities highest in the most accessible, well-located districts to make more efficient use of the land. Central cities tend to accommodate economic activities that benefit most from proximity, business interaction and high capacity public transport connections, such as corporate head offices and financial and business services. In contrast, land-intensive firms, such as assembly plants and logistics, tend to be located on the periphery. Specialized clusters of smaller enterprises may sort themselves into particular districts to benefit from niche services and shared inputs. Residential areas tend to surround the main business districts, with densities and property prices generally declining with distance as households trade accessibility off against living space and gardens (Venables, 2015; World Bank, 2013).

The availability of public space is vital for the circulation of people, goods and information though arterial roads, public transport networks, cycle paths, water pipes, sewage systems, stormwater drainage, electricity cables and other utilities. Public squares, parks and playgrounds are necessary for social interaction and informal markets, especially where personal living space is constrained. Some of the most prosperous cities in the world devote a third or more of their central areas just to streets (Angel, 2016). The same research suggests that cities

in developing countries devote far less land to streets than cities in developed economies. City governments can only afford to protect public space and rights-of-way from commercial development, and to invest in costly urban infrastructure and the quality of the public realm, if they possess robust fiscal capabilities enabling them to raise the revenues they require through property taxes, borrowing powers and/or land value capture.

THE URBAN LAND-INFRASTRUCTURE-FINANCE NEXUS

There are interdependent, mutually reinforcing links between urban density, economic growth, rising land values, revenue generation and investment in infrastructure. Depending on how well it functions, this nexus between urban land, infrastructure and the development of the built environment can enhance or compromise the long-term economic trajectory of cities. This section is particularly concerned with the ways in which agglomeration dynamics can be impaired by the physical structure. In effect, the ‘diseconomies’ of scale and density can escalate to the extent that they outweigh the advantages, potentially setting in train a cycle of lower investment, depressed productivity, underemployment, lower taxes, infrastructure backlogs, congested public spaces and more vulnerable communities.

The obstacles identified below are apparent to a greater or lesser extent in cities throughout the world, although they tend to be more acute in Africa (AfDB, 2013; Buckley & Kallergis, 2014; Foster & Briceno-Garmendia, 2010; Palmer & Berrisford, 2015; UN-Habitat, 2014, 2015). The outcome is a kind of low-income, low-investment equilibrium in many African cities. There are complex reasons for this that are beyond the scope of this article. They include Africa’s history of colonization and political instability, territorial fragmentation, narrow and fragile economies based on natural resource extraction, undeveloped financial markets, high risk business environments and governing institutions that lack sufficient capacity to raise revenues and invest in essential public services (Collier, 2015; Foster & Briceno-Garmendia, 2010).

The issues identified below revolve around three core pillars of the urban land-infrastructure-finance nexus: the governance of land, the provision of infrastructure and the financial capabilities of local institutions. These processes and policies need to work together to create conducive environments for investment to realize the transformative potential of agglomeration—the ‘urban premium’ (Turok, 2016). One of the most visible manifestations of persistent weak capabilities in all three respects is the proliferation of informal settlements. An estimated 62 per cent of African urban households live in overcrowded ‘slums’ lacking basic services, infrastructure and common spaces (UN-Habitat, 2014). This is debilitating, dangerous and damaging to the prospects for creating stable, efficient and responsive public institutions, and is far higher than anywhere else in the world.

THE GOVERNANCE OF LAND

The governance or management of land relates to the institutions and mechanisms that allocate land to appropriate uses within urban areas, including property rights, land valuation systems and rules that control property development. Fair and transparent arrangements are particularly important because urban land is such a valuable resource that it is susceptible to rent-seeking, collusion and other forms of manipulation by powerful interests. In many African countries, land is also a sensitive and emotive issue because of the legacy of colonial dispossession, social control and segregation. In the context of widespread poverty and unemployment there is intense competition for urban land because of its scarcity. It is a crucial vehicle for rural migrants to gain access to livelihood opportunities in the city, whether through unauthorized occupation or

small payments to those who own or control the property. In the absence of a common framework of norms and guidelines to govern behaviour, makeshift physical structures tend to be laid down in a haphazard, disorderly pattern. As these settlements expand, there are mounting congestion costs and environmental hazards for the community (Andreasen & Møller-Jensen, 2016; Glaeser & Sims, 2015; UN-Habitat, 2014, 2015).

Around the periphery of many African cities there are overlapping statutory and customary (traditional) land tenure systems, which coincide with widespread informal practices of land management (Napier, Berrisford, Kihato, McGaffin, & Royston, 2013; Payne, Durand-Lasserve, & Rakodi, 2009; Rakodi, 2006). This causes much uncertainty over peoples' rights to own and occupy property, and to prevent others from having rights of access or use. This is frequently a source of inefficiency, insecurity and unfairness (Durand-Lasserve, Durand-Lasserve, & Selod, 2015; Fox, 2014; World Bank, 2013). Where there are multiple claimants, confusion over who has secure rights to particular land parcels generates long-running, damaging disputes (Pons-Vignon & Lecomte, 2004). The ambiguity also provides a cover for corruption, and makes it easier for powerful groups to exploit the vulnerability of the poor (Durand-Lasserve et al., 2015). Conflicts are most apparent where there is strong pressure for land as cities encroach upon the countryside. These clashes are frequently driven by the sizeable uplift in land values as rural land is converted to urban. In many cities there have been evictions of poor communities who thought they had rights to the land, only to discover that someone else apparently had a more legitimate claim (Huchzermeyer, 2011; Ubink & Quan, 2008). A recent UN-Habitat report describes how:

A plurality of informal power dynamics have emerged in African cities that determine how land is used, serviced (or not), rented out, profited from and made available ... (they) knit together elected politicians in loose coalitions with local strong men who rely on force, traditional authority status or dominance of political parties to exert control ... it is almost impossible to break the power of these de facto property and commodity mafias (2015, p. 25).

From the viewpoint of economic growth, doubts and disputes about who ultimately owns the land inhibit investment in the improvement and development of the property, since there is no assurance that the resources committed will be recouped (Cai et al., 2015; Lozano-Gracia, Young, Lall, & Vishwanath, 2013; World Bank, 2013). The result is the erection of many low-rise, insubstantial structures rather than the construction of durable assets that would appreciate in value over the course of time. Multi-storey buildings could also accommodate many more households and firms within them, and stimulate substantial job creation in the construction industry and its suppliers (Collier & Venables, 2015). Another outcome of unequally distributed property rights in many older African cities is a scattered spatial pattern of formal private sector clusters of buildings underpinned by legal titles, interspersed by areas of relative neglect and vacancy where rights are in doubt and surrounded by sprawling squatter settlements with no rights or public services at all.

A related problem is the lack of a systematic and objective method of assessing land values in many cities (Durand-Lasserve et al., 2015; Lozano-Gracia et al., 2013; World Bank, 2013). This is required to assist the exchange of land and its conversion to more productive uses (e.g. from rural to urban by compensating farmers fairly). Land valuation also makes the incentives for upgrading, refurbishing and redeveloping property more transparent. The active management of buildings is vital to ensure that they enable the enterprises that occupy them to be productive because they are fit for purpose. As buildings become old and obsolete, and the demand for urban space increases over time, property valuation systems should facilitate retrofitting and redevelopment to accommodate additional occupiers and new activities.

Where private property owners hoard land and do not respond to changing conditions or public needs, state authorities may need to acquire vacant, underutilized or abandoned land and buildings. This is most important in strategic locations, such as in and around economic centres and transport nodes, and to accommodate new settlements, public facilities and infrastructure. This may require special powers of compulsory purchase or expropriation, which vary greatly between countries. Following a proper legal process is important to avoid such powers being abused and land confiscated unreasonably. Periodic state abuse has occurred in Zimbabwe, Nigeria, Kenya, Uganda, Rwanda and Ethiopia, with serious economic and social consequences (Huchzermeyer, 2011; Potts, 2015; Watson & Agbola, 2013). Valuation systems have a role to play in ensuring fair compensation for property owners. Land banking is another strategy potentially available to public authorities, although not widely used in Africa, to assemble sites for development or to regenerate run-down areas and blighted buildings where fragmented ownership or depressed market conditions discourage private investment. It involves acquiring empty properties, rehabilitating derelict buildings, upgrading the surrounding environment and repositioning the locality in the minds of firms, households and developers. Intervening at scale can prevent speculation and expedite the redevelopment process.

A separate issue is the existence of official land-use zoning schemes, building regulations and minimum standards that are inappropriate to the local context. These specify matters, such as floor area ratio, living space and building quality. In Africa they are often inherited from colonial times and unaffordable for the local population (Ngau, 2013; Watson, 2009). As a result, they are often ignored in practice, which means that buildings are unauthorized and difficult to finance from formal institutions. Outdated regulations can also prevent higher density development and mixed land uses in well-located areas. As a result, urban land is frequently not allocated to sensible uses at sufficient building heights to promote the intense economic interactions that spur creativity, productivity and investment (Turok, 2016; Venables, 2015; World Bank, 2013). Low density central business precincts and suburban-style housing in inner residential areas are frequently the result of historic zoning schemes and unresponsive land markets. They cause many African cities to have much larger physical footprints than is efficient or desirable.

Street congestion is one of the most palpable features of many African cities, and a symptom of poor planning and neglect for public space. The largest and fastest-growing cities are most likely to experience gridlock, despite their relatively low levels of car ownership (Andreasen & Møller-Jensen, 2016; Cartwright, 2015). They include Lagos, Kinshasa, Accra, Nairobi and Dar es Salaam. Congestion impedes human and economic interactions, adds to business costs, and erodes agglomeration. Poor traffic flow also causes many fatalities, prolongs commuting times and generates air pollution. It is a direct result of spiralling urban populations with inadequate advance preparation. Traffic bottlenecks often reflect underinvestment in arterial roads, and disorganized housing development on the urban fringe (Angel, 2016; GCEC, 2014). Without regulations to protect public space for roads and utilities, informal housebuilders allocate the bare minimum amount of land for access lanes and walkways to connect new settlements to the existing city. As the population grows this becomes a source of worsening congestion, as well as creating blockages on the relatively few main roads that exist. Environmental hazards are also exacerbated by the poor access for emergency vehicles in the event of shack fires, landslides or flooding in unplanned settlements.

URBAN INFRASTRUCTURE

Robust infrastructure and related services are crucial to well-functioning cities (Ingram & Brandt, 2013). They provide the backbone that shapes the form of urban growth. Reliable and affordable energy and clean water supplies are vital for economic productivity and

household well-being. Transport networks determine the distribution and density of jobs and population. They are essential to get employees to work on time, material inputs to firms and products to consumers. Inefficiency and congestion add to business costs and threaten city competitiveness. Pipelines and cables deliver electricity, sanitation and other public utilities which have far-reaching impacts on living conditions, public health, worker productivity and individual life chances. Stormwater drainage avoids flooding during heavy rain storms and wastewater treatment prevents untreated sewage from polluting rivers and ecosystems. Schools and clinics are fundamental to human development, just as telecommunications has become a necessity for people to access information and build social relationships.

Urban infrastructure is distinctive in the way that the elements link together into an interdependent system. This can have positive and negative consequences. A bottleneck in one part of the system can cause disruptive knock-one effects elsewhere. Conversely, a well-connected system distributes the flows efficiently to avoid overload and creates beneficial network effects from higher levels of usage. The idea of green infrastructure extends this idea further in making effective use of natural systems, such as water courses, green open spaces or parks. These ecosystems can reduce stormwater runoff and pollution, improve the supply of fresh water, support climate change mitigation and enable cost savings by reducing the need for costly bulk infrastructure and concrete facilities (Cartwright, 2015; World Bank, 2016).

The governance arrangements for infrastructure are vital to maximize the socio-economic and environmental benefits of these investments (AfDB, 2013; Ingram & Brandt, 2013). Recognizing the strong connections between transport and land-use impacts is a classic instance where the alignment of separate planning processes is imperative for efficient outcomes. Transport shapes the character of urban expansion, just as the demand for travel is determined by land-use patterns. New public transport routes need to be planned in conjunction with a range of other public facilities required to permit transit-oriented housing development. Improvements in public transport coupled with higher density, multi-storey housing are fundamental to the improved functioning of African cities. Careful attention to designing convenient, dense, affordable and liveable neighbourhoods will also help to reduce the demand for private cars and suburban lifestyles as incomes rise.

Gaining the synergies from different forms of infrastructure requires collaboration and flexibility across different government departments, agencies and spheres. Metropolitan spatial frameworks could help to plan these connections and anticipate the impact of new infrastructure on the demand for land from households and firms (UN-Habitat, 2013, 2014). A strategic city-level perspective is also necessary to recognize the long lifespan of infrastructure and to assist in phasing maintenance, renewal and replacement operations. City-level decision-making can support large-scale job creation in the construction sector through local procurement of building materials, rather than imports. However, key decisions regarding infrastructure in African countries tend to be made at national level based on separate sectoral perspectives, to the neglect of essential local interactions and impacts (United Cities and Local Governments of Africa [UCLG Africa] and Cities Alliance, 2013): 'African efforts at functional devolution of responsibility for services and fiscal decentralization of fiscal authority ... seriously lag behind other regions of the world' (Gutman, Sy, & Chattopadhyay, 2015, p. 4). A much stronger case needs to be made for the devolution of many of these powers and decisions, and their integration into city-level infrastructure plans.

In addition to poor internal mobility, many African cities experience poor external connectivity (World Bank, 2009). An obvious challenge is their long distance from relatively prosperous international markets. Their main roads linking them to other cities, surrounding towns and rural areas are often congested and badly maintained (Foster & Briceno-Garmendia, 2010). Their road and rail connections to cities in other countries suffer from slow and

bureaucratic border controls. Their seaports tend to lack modern handling facilities and are therefore inefficient and congested, and air transport connections within Africa are generally very costly (Bryceson & Potts, 2006). These factors undermine the competitiveness of African cities, dampen business investment and act as a drag on economic development.

Despite the compelling case for public investment in urban infrastructure, most African cities experience large and indeed escalating backlogs and bottlenecks as a result of continuing underinvestment (AfDB, 2013; Cartwright, 2015; Leipziger et al., 2015). Part of the problem is that the exceptional requirements of cities are often overlooked by governments and international funding institutions: ‘infrastructure needs and financing options at the subnational level, especially for growing urban areas, have been largely ignored’ (Gutman et al., 2015, p. 3). In the absence of state delivery, people devise self-help solutions and informal systems of service provision, but these impose a huge strain on their time, energy and resources and the outcome is inferior to properly planned public services (Andreasen & Møller-Jensen, 2016; UN-Habitat, 2015). National governments regard the weaknesses of local institutions, economies and tax bases as justification for maintaining central control over key functional responsibilities within cities.

A comprehensive study by multi-lateral lending institutions and international donors estimated that the cost of addressing Africa’s glaring infrastructure gap is around \$93 billion a year (Foster & Briceno-Garmendia, 2010). This amounts to 15% of African GDP each year and is double the current spending level. The most significant elements, in order of priority, are electricity, water, sanitation and transport. These deficits undermine human development, inhibit business investment and retard economic growth (Anderson and Dalgaard, 2013). They mean missed opportunities to create jobs directly through the provision of this infrastructure. Foster and Briceno-Garmendia (2010) also found that Africa’s infrastructure services are twice as expensive as elsewhere, partly because of fragmentation and discontinuities in supply. A phased approach to investment, with initial concentration on the cities as drivers of growth, would be most cost-effective, thereby lowering the costs of energy, water and other services.

Fixed urban infrastructure is complicated to install and socially disruptive, especially if it means retrofitting after the land has already been settled and built upon (Andreasen & Møller-Jensen, 2016). Many national and local governments in Africa lack the technical capacity to prepare and execute infrastructure projects, which typically results in a long, drawn-out process (AfDB, 2013; Collier, 2015). There is a heavy reliance of foreign donors and international consultants, rather than developing local capabilities to design and manage projects. The dependence on external expertise to deliver discrete projects complicates the task of strategic coordination. The fragmentation of infrastructure procurement also makes it more difficult to develop consistent technical standards that would yield economies of scale in the supply of technologies, equipment and materials produced in Africa. If they had more control over the process, national and local governments could agree on compatible norms and specifications governing electricity generation and transmission, railway rolling stock and track gauges, water pipelines, dams and telecommunication networks. This could lay the basis for a division of labour to emerge across the continent, with different cities and regions specializing in different aspects of infrastructure provision, and permit the high level of foreign imports to be reduced.

Coordinating the investment decisions of businesses, households and government entities depends on the existence of a forward-looking strategic framework to guide future urban growth. In many African cities municipal land-use plans are essentially passive policy instruments—geared to regulation and control rather than making things happen—and they suffer from weak enforcement capabilities (Ngau, 2013; Watson, 2009). Part of the problem is that municipalities employ very few planning professionals, so the ability to follow through and implement decisions is limited. Another missing ingredient is a complementary public

infrastructure investment plan that would help to spur private investment by demonstrating real government commitment to key locations and helping to unlock the value of undeveloped land (Palmer & Berrisford, 2015). The national locus of infrastructure decisions tends to undermine the credibility of municipal spatial plans to assure private investors about the future of particular places.

A related problem with municipal land-use plans is that they are often prepared in line with outdated legal procedures and building standards (Ngau, 2013; UN-Habitat, 2013, 2015; Watson, 2009). They tend to be top-down blueprint plans, whose approach is excessively prescriptive and inflexible, and based on questionable assumptions about the nature of demand for the land. They are often unresponsive to, and based on little knowledge of, property market dynamics, local land values and the amount of space that most households and firms can genuinely afford. Therefore they are often unrealistic and disregarded. Human settlements frequently grow in a piecemeal, chaotic and unstructured manner (UN-Habitat, 2013, 2014; Watson & Agbola, 2013). Land is built upon whether or not infrastructure is available, resulting in insufficient water and energy supplies, overloaded sewage treatment facilities and regular flooding of low-lying areas. The outcomes are clearly deleterious in terms of efficiency, equity and liveability (Andreasen & Møller-Jensen, 2016; Glaeser & Sims, 2015; UN-Habitat, 2015).

FINANCE FOR INVESTMENT

The third pillar of the urban land-infrastructure-finance nexus is finance for investment. The enormous scale of the funding gap between readily available resources and the need for extra investment in urban infrastructure and public goods is clear. An additional complication is that large capital outlays are required up front to provide facilities and spaces that may not be fully in demand for a decade or more. The implication is that city and national governments need to be highly creative and pragmatic about potential sources for the substantial funding required. They need to seek investment from diverse international, domestic and local funders, both in the public and private sectors. Much of the discussion to date has focused on national and international funding sources, such as the new BRICS development bank (Gutman et al., 2015). There has been far less discussion of the role of local mechanisms, including property taxation and borrowing (AfDB, 2013; World Bank, 2013).

There are compelling reasons why a larger share of the funding required for urban infrastructure should be generated locally. First, local financing encourages discipline and accountability by making decision-makers answerable to local households and firms who pay their taxes. It can therefore help to strengthen local government as a democratic, developmental institution and reduce the incidence of rent-seeking and malfeasance by public officials. Second, local financing enables accelerated investment by creating a revenue stream from property taxes, levies and service charges, and demonstrating the capacity of municipalities to repay debt. This can then be used to access long-term credit from development banks, to issue bonds or to attract private sector investment. Third, local control over funding facilitates the spatial coordination of sectoral policies—transport, water, energy, etc. This makes it more likely that urban infrastructure projects will be integrated into the urban fabric and aligned with future plans for city expansion. Externally financed projects are more likely to be designed as standalone schemes that are ‘parachuted’ into cities. Fourth, local financing may be more stable than relying on financial transfers (grants) from national governments or international agencies. These often fluctuate from year to year depending on wider conditions, and can also mean undue external interference in municipal decisions.

There are further reasons why the financing of infrastructure should be specifically linked with the development of urban land. Land is a very important source of taxation in urban areas because it is immobile and evasion is difficult. Part of its value derives from regulatory approval for changes of use from agriculture, or for more intensive redevelopment of older buildings. This uplift in value attributable to an administrative decision is unearned by the landowner and therefore an efficient target for revenue generation. Another part of the value of urban land stems from investment by other private and public sector actors nearby, so the same principle applies that much of the uplift in value is unearned. The very direct and obvious connection between public investment in infrastructure—such as roads, public transport and water supply—and the enhanced value of newly serviced land makes it particularly appropriate to secure a share of the uplift through ‘betterment’ levies, development charges or property taxes (Ingram & Hong, 2012; Palmer & Berrisford, 2015). A rather different approach is for the state to acquire peri-urban land and then sell or lease it after planning permission or development rights have been granted, or after the basic services have been installed. Land sales are relatively simple and raise revenue immediately, but the benefit to the city is once-off rather than a long-term flow to meet ongoing financial requirements.

Capturing the increase in land values created by public investment and the broader process of urban development enables scarce public resources to be recovered and reinvested in additional public goods and community assets. This has been a powerful set of instruments used by governments throughout the world to create more liveable and higher quality human settlements (Palmer & Berrisford, 2015; UN-Habitat, 2015). It has also helped to avoid land speculation and hoarding. Land-based infrastructure financing is most attractive in the context of rapid urban growth, when land prices are accelerating and there are opportunities to generate considerable revenue. Implementing such mechanisms require clearly defined property rights and registration systems, objective methods of valuing land, a willingness among citizens and firms to pay local taxes, legitimate political institutions to collect the relevant charges and robust judicial systems to handle disputes (World Bank, 2013).

The idea of land-based financing can be traced back to Henry George and Ebenezer Howard in nineteenth century Britain and has a long pedigree internationally in the development of new towns, garden cities, satellite towns and eco-cities. Howard believed he had devised a self-financing model of urban development to address the problems of burgeoning, overcrowded and polluted industrial cities. The idea was to acquire cheap agricultural land at existing use value and design attractive, free-standing cities in the countryside that would appeal to people as places to live and work. The key to funding these developments was to harness the rise in property values in order to repay the debt incurred at the outset and to invest in house-building and improved civic amenities, rather than to allow individual property owners to profit. History suggests that Howard overestimated the capacity of such developments to pay their own way, bearing in mind the high costs of urban infrastructure and public services (Bowie, 2016).

Nevertheless, the principle of land-based financing is vital and it can make a major contribution to the costs of installing urban utilities and public facilities. Countries in East Asia—particularly China—have learnt this lesson well, although not without some qualifications (McGranahan, Guoping, Han, & Hoekman, 2014; OECD, 2013). Over the last three decades China’s growth machine has been driven by the conversion to urban uses of agricultural land expropriated from rural collectives and peasant farmers. The enormous uplift in land values and tax revenues have financed massive physical infrastructure and housing schemes (see for example Liu, Dunford, Song, & Chen, 2016). National rules have enabled municipalities to retain most of the proceeds from selling long leases on state-acquired land for urban development, and the process has been fuelled by fast-track regulatory procedures. The

main controversies have surrounded the level of compensation to rural communities, environmental degradation and municipal corruption (Miller, 2012).

Many municipalities in African cities lack the legal powers or administrative capacity to collect property taxes, to impose development charges or to expropriate peri-urban land in order to sell it at a higher price. They lack these powers because central authorities are reluctant to concede any control over tax revenue sources (Ingram & Hong, 2012; UCLG Africa and Cities Alliance, 2013). Even when they possess the powers, municipalities find it very difficult to collect such taxes because property values are not defined using consistent methods that are regularly updated, so they could easily be disputed. It is also unclear exactly who should be expected to pay such taxes, particularly where customary land ownership prevails. Even in South Africa, where there are formal systems of land valuation and property registration in place, households living in traditional areas pay no property taxes. Very few municipalities across Africa have the political weight and technical capabilities to impose betterment levies or development charges on property owners who benefit from planning permission or investment in public works. Consequently, the revenues from land-based financing are very low in most African cities (UN-Habitat, 2015). This is a serious missed opportunity, bearing in mind the suitability of land-based financing for situations of rapid urban growth and escalating land values.

The absence of workable land-based financing instruments operated by strong local administrations has recently become an even more pressing concern in African cities because of the potential for manipulation by astute global investors and real estate developers. Local authorities are understandably enthused by the prospect of substantial foreign investment, new commercial and residential developments, and associated job creation in construction. They may be encouraged to provide cheap land, to grant generous development rights, and to invest in the essential infrastructure and services to accommodate the new property complexes, mega-projects and satellite cities. However, without the legal instruments, information systems, technical capabilities and bargaining powers to negotiate fair and reasonable arrangements, in which the community as a whole shares in the value created and the public sector recovers an appropriate proportion of its investment, cities may be vulnerable to shrewd practices by experienced property developers and financiers (Palmer & Berrisford, 2015).

CONCLUSION: AN AGENDA FOR RESEARCH

Africa's spiralling urban population presents serious social and environmental challenges. In many cities there appears to be a kind of low-income, low-investment equilibrium that requires disruption. Evidence from around the world indicates that the potential exists for urbanization to transform economic trajectories and raise living standards if suitable conditions are established. Meanwhile, the international policy environment is changing and more favourable attitudes are emerging towards cities, particularly the economic rationale for urban policy. There is also new-found interest from global investors and real estate developers in African cities. There are opportunities, therefore, for a bolder approach to urban development through the introduction of new policies and procedures.

The article argues that the economic prospects of cities hinge on the quality of their physical foundations, which underpin functional efficiency and will endure for many decades. Realizing the developmental potential of urbanization therefore requires more systematic and concerted efforts to plan and manage the form of urban growth. Harnessing the urban land-infrastructure-finance nexus means reformed arrangements governing the allocation and taxation of land, major investment in urban infrastructure, and stronger local institutions to

coordinate land and property development. These processes and policies need to link together effectively to create conducive environments for growth and development.

Many of these arguments are currently pitched at a rather general level. There is little reference to significant national and regional variations across Africa, or to important differences between individual cities. There is also little discussion of underlying interests and who benefits from current arrangements, as well as the distinctive, but complementary, responsibilities of central and local governments. It is important therefore to develop a deeper understanding of the physical urban predicament facing many parts of the continent and the obstacles to change. The rest of this conclusion outlines an agenda for future research on the African urban land-infrastructure nexus.

First, it is important to locate Africa's experience in a wider international context. There is further work to be done on why urbanization in Africa has not been accompanied by similar advances in prosperity to those achieved in Asia and Latin America. In particular, detailed comparative research on the governance of land, infrastructure and the built environment in different low- and middle-income countries would be illuminating. Is it possible to be more specific about the extent to which, and ways in which, the physical and institutional structures of cities influence their economic performance? What are the fundamental causal relationships between density, connectivity, infrastructure capacity and productive activity? An important policy question is about prioritization and sequencing: what is the most effective way for governments to break into the cycle of underinvestment, poverty and weak institutions? What policy interventions can make the biggest difference? A similar concern is how more transparent, responsive and simplified systems governing land and property can be introduced in the context of immense pressure on land and extensive informality, with widespread disregard for state regulations?

Second, more detailed research is needed on what might be described as the political economy of land and property, i.e. the array of underlying interests, incentives, ideas and power dynamics that support the status quo (Fox, 2014; Palmer & Berrisford, 2015). Current systems and procedures do not exist in a vacuum, but because they further the aims and objectives of selected groups, some of whom are highly influential, politically and economically. Research on the political economy of land and property needs to investigate how powerful interests exert control over land and property development, and how selected politicians, public officials, landowners and private investors form alliances and negotiate their way through prevailing rules and procedures. Research on how inefficient and dysfunctional arrangements have been circumvented would be equally valuable, including how the role of spatial planning in shaping urban development can be strengthened.

Third, it is important to explore local, regional and national variations in the urban land-infrastructure-finance nexus. How do the connections between different forms of land governance, infrastructure provision, and locational decision-making by firms and households play out in different cities and countries? What are the mechanisms for developing higher density, well-connected and more liveable low income housing as an alternative to sprawling informal settlements? What determines the balance between urban compaction and densification, on the one hand, and peripheral expansion, on the other? How do the costs and benefits of different outcomes impact on different social groups and communities? What are the main policies that can successfully promote urban consolidation and *in situ* settlement upgrading, and what are the principal constraints faced?

Finally, further research on land-based financing of urban infrastructure is vital to explore its scope and limitations. Which particular policy instruments offer most potential in different circumstances, and what scale of revenues is it realistic to expect them to generate? How can property taxes be introduced in situations without land valuation systems, and with ill-defined property rights and customary land tenure? What are the minimum technical capabilities and

regulations required for municipalities to recover at least part of the costs of installing public services and to share in the uplift in land values arising from granting development rights to major investors and property developers? What are the best examples of cities that have managed to negotiate outcomes that benefit the many not the few, and how has this been achieved?

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

NOTES

¹ The level and rate of urbanization vary greatly across the continent. Northern and Southern Africa are relatively urbanized, whereas urbanization in West and East Africa is increasing rapidly from a lower base. National differences are even greater. We accept the risk of over-generalization when discussing the continent as a whole in return for greater clarity about the underlying patterns and dynamics.

² For an analysis of similar phenomena in Asia, albeit with the state playing a more interventionist role in the land market, see Shatkin (2008, 2015).

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