

Urban Expansion & the Periphery

Research Cluster Framing Paper
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The AUL is a research center at the African School of Economics-Zanzibar focused on rapid urbanization across Africa.

OUR WORK

RESEARCH

We conduct frontier research on African urbanization, currently focusing on four research clusters: Urban Expansion & the Periphery; Innovative Urban Governance; Urbanization & Industrialization; and Cities, Culture, & Technology.

TRAINING

We provide short trainings and capacity building programs to the current generation of city officials, urban planners, and municipal leaders.

EDUCATION

We provide longer-term educational programs to the next generation of city builders, planners, and urban leaders.

1. Motivation

Africa's future is an urban future, as evident from the continent's demographic trends. By 2100, five of the ten most populous countries in the world will be located on the African continent: Nigeria, the Democratic Republic of Congo, Ethiopia, Tanzania, and Egypt (Ghosh, 2020). Many cities across the continent are already experiencing exponential growth as urban populations boom and rural residents seek access to economic opportunity in cities. By 2050, the urban population of Africa is expected to increase by 950 million people (OECD, 2020). By the end of the century, the continent is projected to boast some of the biggest cities on the planet, such as Lagos (Nigeria), Dar es Salaam (Tanzania), and Kinshasa (Democratic Republic of Congo) (Satterthwaite, 2024; Hoornweg & Pope, 2016).

This explosive urban growth presents substantial challenges, but also tremendous opportunities if expansion is guided by a basic urban plan. Right now, cities are expanding at an unprecedented rate. Recent research shows that a typical sub-Saharan African city has tripled in physical area between 1990 and 2014, growing outward, while also densifying its older areas (Angel et al., 2016; Lall et al., 2021; Angel et al., 2021). Urbanization is always accompanied by spatial expansion - in all contexts, at all time periods, including on islands where land has to be created from scratch at great expense. It's a feature, not a bug, of urban growth. Most new urban residents settle on the periphery of cities, including cities in wealthy countries where urbanization is largely complete. In places with proportionately more population growth, the amount of land developed on the edge will be greater.

Densification of the existing area of the city is inhibited by regulations and issues of tenure security, but more pertinently by challenges accessing finance. Densification of the periphery occurs over time, usually taking about two decades from when an area begins to urbanize to when it reaches its steady-state density. However, infrastructure constraints keep urban areas from expanding outward to the optimal degree, forcing people to consume less floorspace than they would otherwise. Eventual densification of the periphery is also inhibited by lack of infrastructure, because peripheral lands end up with much worse access to the metropolitan labor market than they would if they were properly serviced, so their value is lower. Ironically, this results in higher per capita land consumption on the periphery, but smaller than optimal cities.

Urban expansion makes cities more accessible and productive by allowing new residents and firms to access land in urban areas at prices they can afford. But unstructured urban expansion is dominating in many African urban centers, as opposed to planned growth (Lamson-Hall et al., 2018), with consequences for urban productivity and the inclusion of new residents. The peripheries of many cities are experiencing haphazard development with inadequate infrastructure, transportation connectivity, and security. Unplanned growth, in combination with tenure security issues and financing challenges, is resulting in lower land values, inefficient land uses, greater exposure to environmental risks, and less productive cities.

When governments fail to plan enough land for formal settlement, prices escalate beyond the ability of most people to afford. New urban residents have no choice but to seek land in the informal market. One of the most visible consequences of this unplanned growth is the proliferation of informal settlements. Although, historically, slums are a common part of the emergence and growth of cities, and offer hope of a better life for millions, informal settlements are often characterized by low living standards. Residents tend to lack access to essential sanitation services and basic public services, increasing disease risk (Nadimpalli et al., 2019). Tenure insecurity is common, as well as poorly constructed and congested housing (Prindex, 2024; Chipeta et al., 2018). Slum residents often lack easy access to public transit, reducing mobility and increasing the distance and time it takes to access services and jobs (Nakamura & Avner, 2018). Due to encroachment on vulnerable sites and land degradation, sprawl heightens environmental vulnerability as well.

Not only do these conditions harm resident wellbeing, but they also undermine urban productivity. Fragmented urban form inhibits full realization of the benefits that often come with urban density: decreased transportation costs, reduced per capita emissions, lower public service provision costs, higher wages, increased consumption, and greater rates of innovation (Krugman, 1991; Hong et al., 2022; Bettencourt et al. 2021; Ahlfeldt & Pietrostefani, 2019). Instead, African cities seem to be experiencing more of the downsides of density, including expensive real estate, crowding, and social conflict (Lall et al., 2021; Duranton & Puga, 2020). As a result, the link between urbanization, industrialization, and structural transformation is breaking down in many modern African cities (Gollin et al., 2016).

Despite the clear need for effective urban planning, existing systems are struggling to keep pace with rapid urbanization. Three key challenges stand out. First, planning institutions are chronically underresourced and understaffed, leaving them unable to project expansion and implement their plans effectively. Second, even when plans are in place, weak enforcement mechanisms mean that non-compliance is widespread, rendering plans ineffective. Finally, many cities rely on highly detailed master plans modeled after those used in the Global North—an approach that is often ill-suited to the dynamic and resource-constrained contexts of African cities. As a result, rather than facilitating organized growth, current planning practices contribute to inefficiency and fragmentation.

Globally, about one billion people live in informal settlements (UN-Habitat). In African cities, the share of urban residents living in slums is significantly higher than the global average: almost 60% compared to 34% (Lall et al., 2017).

Historically, urbanization and economic development have gone hand in hand (Romer, 2015). More developed countries tend to have higher urban population shares, and periods of rapid urbanization are also associated with increased economic growth.

In contrast, urban expansion planning (UXP) offers a simple, scalable, and cost-effective alternative to large-scale urban master planning (Lamson-Hall et al., 2018). The UXP approach focuses on four key elements: expanding city boundaries, delineating public and private land, securing land for a grid of arterial roads, and protecting environmentally sensitive spaces. By proactively organizing the periphery to accommodate future population growth, urban expansion planning allows cities to harness the benefits that come with urban growth, such as economic development.

Following the UXP approach, work by planners, city officials, and other stakeholders begins by projecting population growth for the next 30 years and expanding city boundaries to encompass this growth. Then, the focus shifts to planning a grid of arterial roads—essential infrastructure that ensures every future household will be connected to transportation networks and public services. Finally, the city works to protect the land for the arterial grid along with large environmentally sensitive areas. By prioritizing these basic, essential steps, cities can grow in a more organized and efficient manner, setting the stage for long-term prosperity.

Urban expansion planning is already a proven solution to rapid urban growth. For example, in New York, the Commissioners' Plan of 1811 expanded the city's buildable area seven-fold, setting the stage for its population and economic boom over the following decades (Ballon, 2012). More recently, since 2013, the Urban Expansion Initiative, led by a team from New York University, has worked with secondary cities in Ethiopia and Colombia training local officials and helping them implement urban expansion plans on the ground. The pilot projects have seen remarkable results.

Findings from sites in Ethiopia show improvements across many measures. A survey in 2024 of 4,000 households in the cities where expansion planning has been implemented showed that those in planned expansion areas earn between 13% and 20% more than their counterparts in unplanned areas, even after accounting for factors such as education, number of working household members, age, and years of work experience (Downs et al., 2024). Additionally, residents are four times more likely to have access to piped water and eight times more likely to have access to electricity. They also experience significantly faster and cheaper commutes, with residents able to reach the city center two-thirds of the time at 58% of the cost.

Between 1990 and 2014, the average city in sub-Saharan tripled in land area while its population doubled (Lamson-Hall et al., 2017). Between 2015 and 2050, the average African city is expected to quadruple in size. Planners must proactively prepare these areas to accommodate and integrate urban residents.

Approximately 570.9 km of roads were constructed over the three-year duration of the project (Lamson-Hall et al., 2017, p. 1243). Cities also benefited from selling leases in the expansion areas, accruing more than \$77 million, some of which went back into further developing the city.

Crucially for many resource-strapped municipal governments, urban expansion planning is also a low-cost and high-return development intervention, with technical assistance costs per city averaging \$200,000 (Downs et al., 2024). Costs for construction and grid marking average \$10 million per city, which is typically paid from the city capital budget over several years. The income premium in a typical city amounts to around \$54 million in extra household income over a 30-year period, producing returns of about 270:1.

The Urban Expansion and the Periphery research cluster at the Africa Urban Lab—the research arm of AUL’s Urban Expansion Planning program—aims to advance the study of urban expansion planning across rapidly growing cities in Africa, asking questions about the importance of preemptive urban planning and rethinking the role of planning in rapidly growing cities. Given the scale and speed of urbanization, it is crucial to better understand the policies and strategies that can guide sustainable, productive urban expansion. The cluster’s agenda is broadly guided by three themes:

1. Regulation, Land Markets, and Infrastructure Expansion

2. Mobility, Opportunity, and Economic Development

3. Urban Sustainability and Resilience

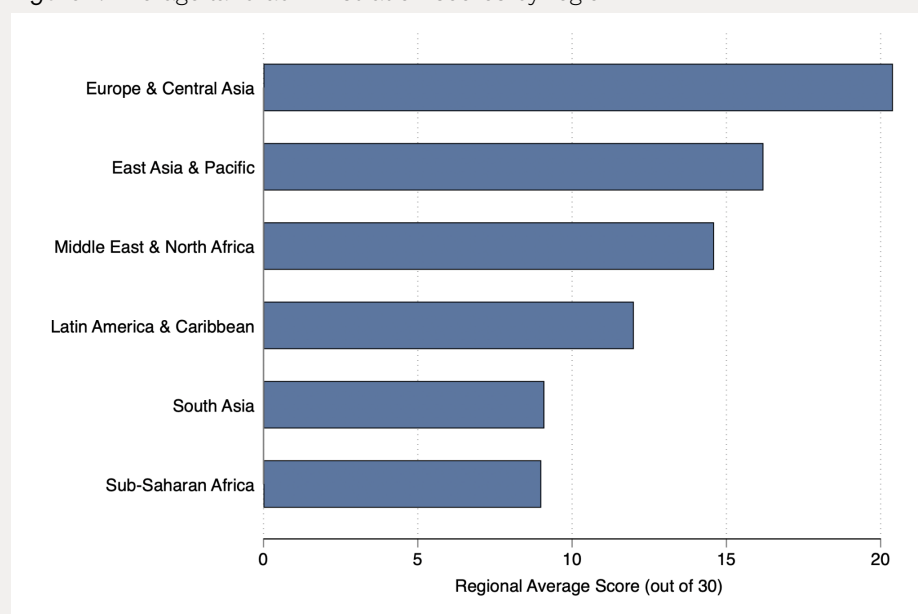
2. Research Themes

2.1 Regulation, Land Markets, and Infrastructure Expansion

Weak institutions and outdated policies contribute to fragmented urban form and undermine the productive growth of cities across the continent. Understanding how governance, and demographic factors interact with market incentives to produce the observed development patterns on the peripheries of African cities is crucial for designing effective urban expansion interventions to promote productive urbanization (see AUL Framing Paper on Urbanization and Industrialization). The contextual factors will vary from place to place, but extant literature offers some general oversights. More specifically, three challenges emerge consistently: unclear land rights and inefficient formal land markets; restrictive building regulations; and lack of early public infrastructure investment.

The establishment of strong land administration systems is foundational to almost all efforts to promote urban development. Land markets cannot function properly when cadaster records are incomplete, outdated or conflicting, when property registration is exceedingly difficult, or when there are no reliably enforced legal protections for land ownership. Tenure insecurity discourages both public and private investment. The OECD (2018) explains that “high real and perceived risks, weakness in the enabling environment, [and] poor project preparation” deter investment in urban development projects (p. 31). Weak land systems and inaccurate spatial records heighten the risks associated with infrastructure projects and undermine the viability of project proposals. In many cities, lack of land transaction data can also lead to undervaluation, increasing potential for exploitation. These interconnected and mutually reinforcing factors contribute to a vicious cycle of limited investment, informality, and inefficiency.

Figure 1. Average land administration scores by region



Source: Author's calculation using data from the World Bank's Doing Business Indicators, 2020.

Second, restrictive zoning and building regulations often limit productive density (Ikeda & Washington, 2015). For example, regulations that restrict building height and floor-area ratios directly limit the amount of floor space that can be built on a given plot of land. This stifles the development of multi-story buildings, especially in central business districts, where there are high land values and concentrated demand for floor space. Rigid zoning can also prevent mixed-use developments, preventing the organic integration of residential, commercial, and industrial spaces that contributes to urban vibrancy and density. Such regulations create spatial mismatches between residential and employment areas, resulting in longer commutes and reduced economic efficiency.

Furthermore, restrictive zoning increases the cost and complexity of compliance to the point where many residents turn to informal markets as a practical alternative. While this provides immediate solutions for affordable housing or business space in attractive locations, it can inhibit other sensible and beneficial planning efforts by pushing development outside formal regulatory systems. Lack of enforcement not only undermines infrastructure planning and service provision but also exacerbates tenure insecurity, as informal developments often lack legal protections and access to credit markets. This, in turn, makes it difficult to secure loans for investment in property and infrastructure development, placing major constraints on urban financing.

Finally, large-scale infrastructure projects are traditionally framed as costly, cumbersome, and requiring a high degree of coordination. This manifests in exaggerated estimates of infrastructure spending, such as the notion that “Africa’s infrastructure needs would cost around \$93 billion a year” (Foster et al., 2010, pg. 6). Embedded in this thinking are assumptions about infrastructure standards, contracting and construction strategies, and management systems that are often contextually inappropriate. Because African cities are urbanizing at comparatively low levels of income, many governments simply lack the capital and the capacity to execute large infrastructure projects (Bryan et al., 2024). This is further exacerbated by poor land administration and centralized fiscal authority, which inhibit municipal governments’ ability to collect taxes and raise revenue for infrastructure.

But “urban infrastructure is [so] difficult to modify...[it] often remains in situ for more than 150 years,” (McCartney, 2024, pg. 8; Lall et al., 2021). This makes the importance of good urban planning and sound infrastructure more imperative: failure to build sustainably now could have resounding effects over the long run. There is a clear need for research into alternative approaches, such as incremental infrastructure construction or

Durand-Lasserve et al. (2015) find that informal land markets attract not only low-income households, but also wealthier buyers and speculators, whose participation can contribute to higher land prices by increasing demand and expectations of future formalization.

accelerated land value capture, that can bring expenditures in line with revenues and structure municipal incentives in such a way as to encourage action and construction.

Optimizing urban expansion planning requires a deeper understanding of the forces shaping urban growth across African cities. A first step is expanding empirical research on both the quantity and quality of urban expansion, establishing baseline data to explore other hypotheses. Second, further investigations are needed into the informal market mechanisms that produce the majority of housing on the African continent, identifying patterns and typologies. It is also crucial to understand how the local political economy impacts land administration and property rights—particularly how power dynamics and vested interests shape land policies and access. Research on adapting building codes and zoning regulations to accommodate higher densities without compromising living conditions is another key area, as current frameworks are often misaligned with rapidly growing contexts. Comparative studies that assess the long-term impact of incremental expansion versus large-scale infrastructure projects could provide valuable insights for policymakers aiming to balance immediate urban needs with sustainable growth trajectories. Addressing these questions will deepen our understanding of how to foster resilient, inclusive, and productive urban developments.

Sample Research Question

- **What patterns emerge in the expansion paths of African cities?**
- **How do informal market mechanisms affect urban expansion and housing development?**
- **What are the economic and regulatory forces that undermine the viability of large infrastructure projects and investment in urban development projects?**
- **How do zoning and building regulations influence spatial development patterns and housing affordability in African cities. How do different fiscal structures and governance models affect cities' ability to raise revenue for infrastructure development?**
- **Can special zone regulation help overcome regulatory building bottlenecks?**

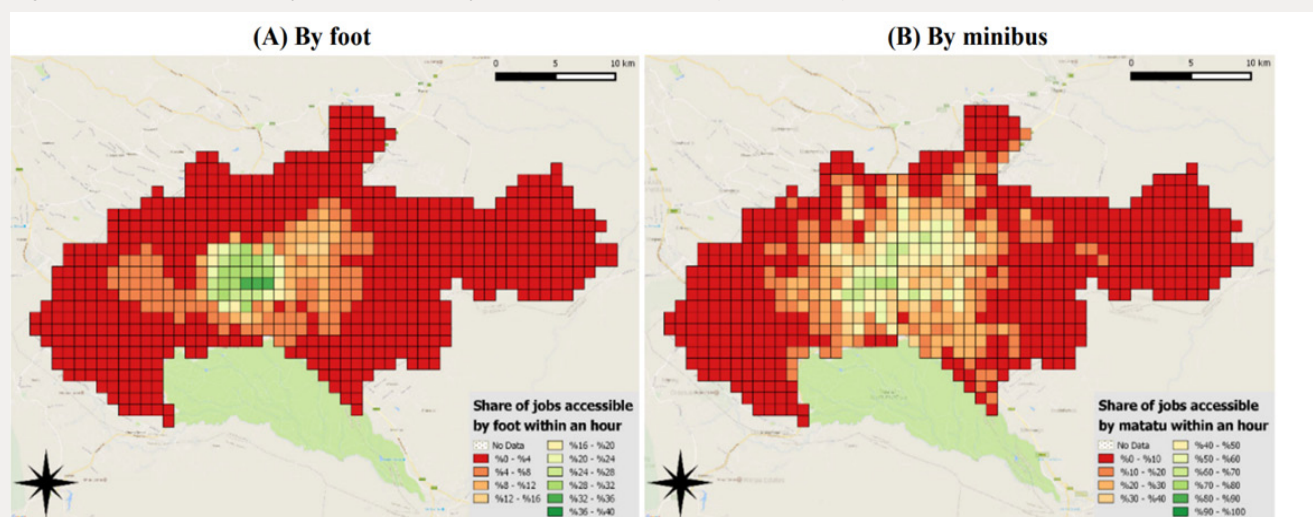
2.2 Mobility, Opportunity, & Economic Development

Cities functionally serve as large labor-pooling markets (Bertaud, 2015). For as long as cities have existed, they have agglomerated people and firms, matched jobseekers to jobs, allowed for specialization, and increased the productive capacity of humanity. As the eminent urban planner, Alain Bertaud, argues, “as long as the labor market does not fragment...the more innovative and productive the city will be,” (Bertaud, 2015). However, institutional barriers leading to sprawl and fragmented urban form are undermining the efficiency of labor markets in cities across Africa. More research is needed to illuminate the complex relationship between urban form, mobility, and economic opportunity, as well as to inform urban expansion planning projects designed to re-connect cities.

The challenges of urban fragmentation are particularly evident in the urban periphery, where many low-income households are pushed into unorganized informal settlements (Lall et al., 2017; Lall et al., 2021). Throughout history, informal settlements have allowed new urban dwellers access to larger urban labor markets by allowing them to settle close to or within the city. For 1.1 billion people globally, slums offer hope for a better life, despite oftentimes abysmal living conditions (UN-Habitat, n.d.). However, because they are often sprawling and chaotic, slums are difficult and costly to integrate into the broader urban landscape, leaving residents disconnected from essential services and economic opportunities. By limiting residents’ access to urban labor markets, informal settlements perpetuate cycles of poverty.

Due to lack of public transport, many residents of informal settlements commute to jobs on foot. Transportation statistics for residents of slums in Nairobi, Kenya offer a pertinent example. Nakamura and Avner (2018) find that 41% of household heads from informal settlements walk to work, compared to 25% of household heads living in planned residential areas. However, on average, “the number of jobs that residents of informal settlements can reach by foot within 60 minutes is 30 percent smaller than for residents in formal residential areas,” (Figure 2; Nakamura & Avner, 2018). Urban morphology, access of public transport, and spatial distribution of firm and residential clustering directly impact individual welfare, but also the overall productivity of the city (Nakamura & Avner, 2018).

Figure 2. Job accessibility in Nairobi, Kenya under various transportation options



Source: Nakamura & Avner, 2018. Cities Baseline Survey, JICA (2013), Digital Matatus Project, and OpenStreetMap.

At its core, urban expansion planning is about creating cities that work for everyone. By focusing on basic infrastructure—roads, public spaces, and essential services—cities can lay the groundwork for sustained economic growth. Getting the urban plan and basic infrastructure right at the early stages of city development is not only significantly cheaper and more politically viable—as opposed to future displacement and relocation—, but it can yield “disproportionate [benefits] over the life of the investment,” (Lall et al., 2021; Collier et al., 2019). Lall et al. explain:

“To support the market forces that drive urban economic agglomeration, productive job creation, and income growth, governments can give priority to policies and investments that coordinate infrastructure investment with land management under forward-looking plans. In addition, governments can provide public goods and amenities that directly enhance livability.”
p. 14

As evidence suggests, planned cities are more accessible, allowing residents to move more freely between home, work, and other services. This mobility is key to fostering functional metropolitan labor markets, which are crucial for economic development.

Urban expansion planning has proven to be an effective technique for improving living standards and re-connecting residents to jobs. For example, in Ethiopia, road grids established through urban expansion planning ensure that no household is more than 500 meters from an arterial road, making it easier for residents to use public, motorized transportation (Lamson-Hall et al., 2018). It also reduces vehicle kilometers traveled by promoting compact growth, and the robust network reduces traffic congestion, lowering fuel consumption. Additionally, residents’ access to the city center has improved dramatically, with commute times reduced by one-third and transportation costs lowered by nearly 50% (Downs et al., 2024). Incomes in those areas are also 10% - 15% higher on average after controlling for education and other socioeconomic factors. These improvements don’t just benefit individual households—they also create a more dynamic and productive urban economy.

More comparative studies on the nuanced relationship between urban form, informality, and labor mobility across diverse urban contexts can provide valuable insights to improve urban expansion projects, especially given the unique

spatial, economic, and political dynamics in cities across SSA. For example, there is a need for more basic research about the factors that influence transportation choices in African cities, especially at low income levels such as those in informal settlements. Additionally, examining how alternative public transport models could serve low-income populations more effectively and affordably could yield innovative solutions to reduce spatial inequality in peripheral zones. Integrating these transport solutions into urban expansion sites can likely yield outsized benefits for residents.

Research could also generate empirical evidence about the job-search behavior of residents in African cities and the employee-search behavior of firms, especially small and medium-sized enterprises. Similarly, it is important to document the long-term social and economic outcomes for residents in planned urban expansion zones, focusing on whether increased accessibility translates to lasting economic growth. More studies should also consider whether there are strategic complementarities between expansion zones and special economic zones, which may improve mobility by locating jobs closer to residents in the periphery. Addressing these questions can deepen our understanding of how to create cities that truly serve all residents and foster inclusive growth.

Sample Research Questions

- **What are the economic consequences of disconnected labor markets?**
- **How can urban expansion planning help locate people closer to jobs?**
- **How does public transportation affect job accessibility and household welfare?**
- **How do forms of public transportation differ across contexts and how can urban expansion planning projects more effectively take these dynamics into account?**
- **How do urban residents find jobs and how do firms find employees?**

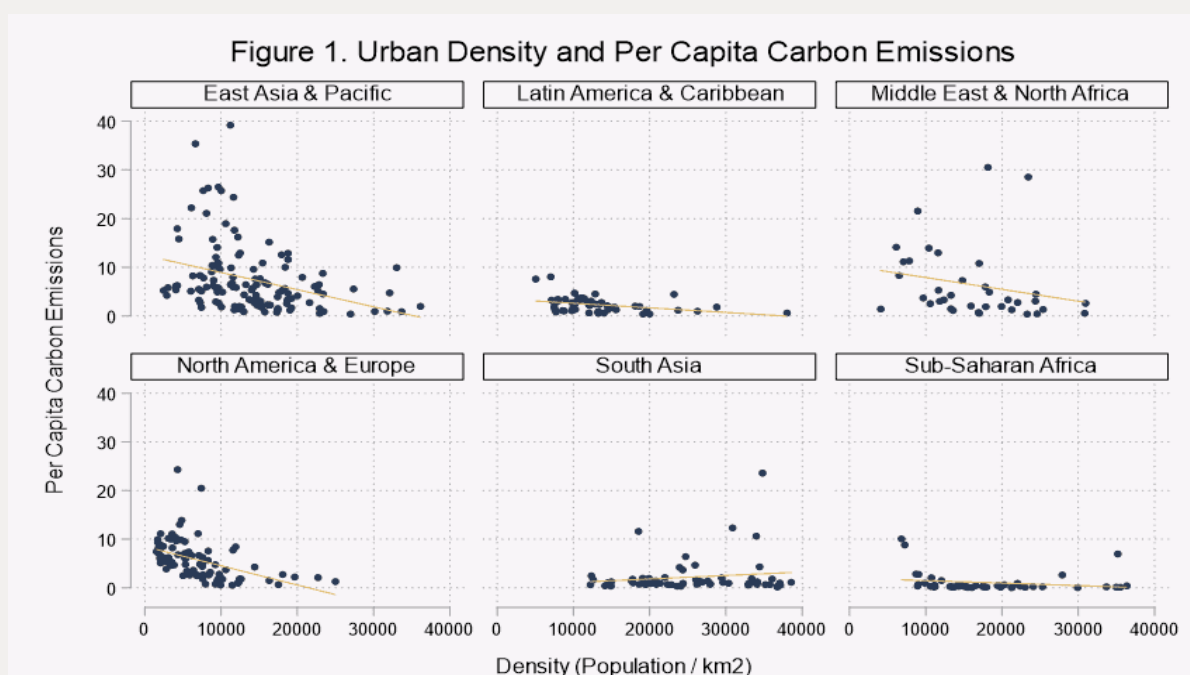
2.3 Urban Sustainability and Resilience

Not only are cities across Africa under pressure from rapid urbanization, but climate change and environmental degradation also pose significant challenges to sustainable growth. As African cities continue to expand, addressing climate risks must become a core component of urban planning, both to mitigate future emissions and improve adaptive capacity. Although African countries have not been significant contributors to the climate crisis, emissions are expected to grow substantially in the coming decades as car ownership rises (Conzade et al., 2022). Moreover, African cities will likely bear the brunt of climate change over the coming decades.

A compact urban form plays a crucial role in reducing greenhouse gas emissions by decreasing reliance on private vehicles and fostering more sustainable modes of transportation (Creutzig et al., 2015). When cities grow in a connected manner, they enable greater use of public transit, cycling, and walking—reducing vehicle kilometers traveled (VKT) and limiting the emissions associated with urban transport. Lamson-Hall & Angel (2022) explain that gridded roads help reduce traffic congestion, which contributes to, “as much as 70 per cent greater emissions rates per kilometre during congested periods in some real-world studies (Rosca et al., 2014),” (p. 55).

By laying arterial roads—especially of sufficient width to accommodate public transport, such as buses—urban expansion planning can help reduce VKT and traffic congestion (Lamson-Hall & Angel, 2022). One of the key benefits of expansion planning is its ability to encourage transit-oriented development, placing residents within 500 meters of major transportation routes and reducing their reliance on private vehicles. Furthermore, gridded networks allow for more efficient travel routes compared to linear corridors, lowering average travel times and allowing for route redundancy (Tsekeris and Geroliminis, 2013; Institute of Transportation Engineers, 2010). Empirical studies estimate that compact city development can lower emissions by approximately 4% over a 20-year period (Seto et al., 2014).

Figure 3. Urban density and per capita carbon emissions



Source: Notre Dame Global Adaptation Initiative Country Index, 2023.

As urbanization accelerates, proactive planning will be essential for ensuring that African cities grow efficiently, but they must also be prepared to withstand growing environmental and climate risks. Cities across the Global South are particularly vulnerable to the effects of climate change due to geographic exposure, economic constraints, and institutional limitations (Figure 3; ND-GAIN, 2023). The Intergovernmental Panel on Climate Change (IPCC) finds that “urban infrastructure, including transportation, water, sanitation and energy systems have been compromised by extreme and slow-onset events, with resulting economic losses, disruptions of services and negative impacts on wellbeing,” (Galvovic et al., 2022, pg. 6). Early adaptation to climate risks is thus of paramount importance for cities across sub-Saharan Africa.

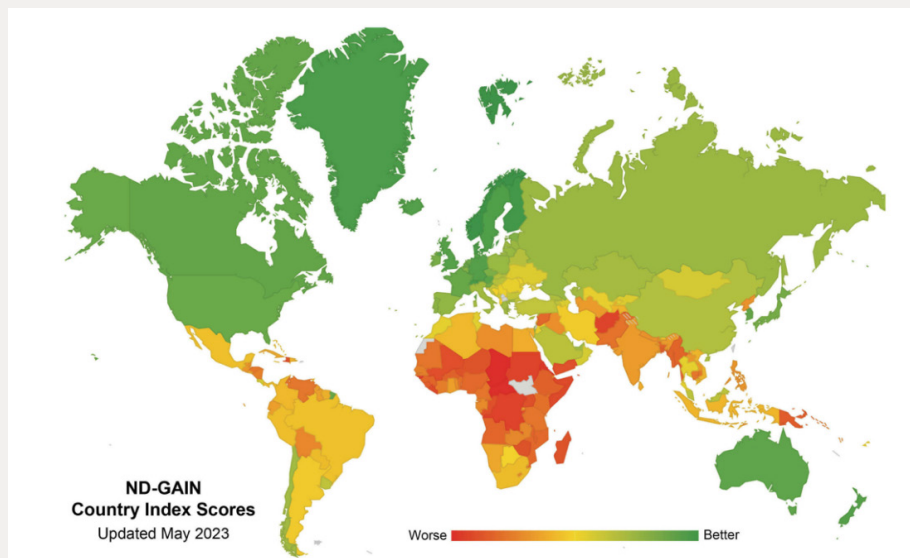
Many African cities are located in coastal zones, floodplains, or arid regions, making them highly susceptible to extreme weather events such as sea-level rise, flooding, droughts, and heatwaves (Klaus, 2024). Rising temperatures, for instance, are intensifying the urban heat island effect due to lack of green space and limited cooling infrastructure (Tuholske et al., 2021). Alarming, a recent study also finds that urban expansion in high flood-hazard (105.8%) and the highest flood-hazard zones (121.6%) outstrips the average pace of global urban expansion (85.4%), especially in “middle-income countries...and low-income countries may risk following this trajectory in the future,” (Rentschler et al., 2023, pg. 91).

This is troubling given the growth rate and expansion patterns of African cities. Because unplanned settlements often emerge near the urban periphery on inexpensive, undeveloped land, there is an elevated risk of building in vulnerable areas, such as floodplains, hillsides, riverbanks, or coastal zones (World Health Organization, n.d.). As unplanned expansion increases in these areas, deforestation or pollution increases environmental degradation, further increasing vulnerability. For example, in Freetown, Sierra Leone, deforestation caused by the growth of informal settlements contributed to massive mudslides in 2017, claiming thousands of lives (Trenchard, 2018).

Tuholske et al. (2021) find that urban exposure to extreme heat increased by almost 200% between 1983 and 2016, impacting 1.7 billion people. These impacts were especially pronounced among the urban poor, limiting their “ability to realize the economic gains associated with urbanization,” (p. 5).

In the aftermath of the 2017 earthquakes in Freetown, the municipal government oversaw a successful community-led tree planting campaign to secure degraded land and limit future landslides—an example of how green infrastructure can provide valuable ecosystem services.

Figure 3. Climate vulnerability is higher in Sub-Saharan Africa



Source: Notre Dame Global Adaptation Initiative Country Index, 2023.

Additionally, because they are not planned or well-regulated, informal peripheral settlements are often characterized by poor service provision, weak infrastructure, sparse economic resources, and unstable housing. Consequently, during extreme weather events, residents of informal settlements are disproportionately impacted, facing higher risks of injury, loss of property, and even displacement. In the aftermath, limited access to clean water, sanitation, and healthcare can worsen health crises, spreading waterborne diseases and creating prolonged recovery challenges.

Not only do informal settlements increase physical vulnerability, but mobility constraints also undermine household resilience by limiting access to economic opportunities in other areas of the city, especially the city center. In this way, the very morphology of the city has a direct impact on micro-level economic resilience. Tenure insecurity also means that households cannot use land as collateral to obtain credit (World Bank, 2021), cannot use their property as a store of wealth, cannot evacuate their land and maintain ownership (Kukkonen & Pott, 2019); and are less likely to invest in sound property management. In this way, although slums act as a critical economic lifeline for many households, they can also keep households trapped in poverty and undermine their ability to recover in the wake of disaster.

Urban expansion planning can guide settlement to areas of lower physical vulnerability to climate change and environmental degradation. It can also build household level resilience by improving households' access to economic opportunity and financial resources. First, because urban expansion planning promotes a more compact, connected urban form, households are better able to access public services and jobs, generating

In a survey (n = 389) of urban residents in Mbale, Uganda, 59% of households believed they were unlikely to prepare for extreme weather events and 53% believed they would be unlikely to recover (Oriangi et al, 2020, p. 65).

higher per capita incomes and increasing households' ability to withstand and adapt to external climate-related shocks. Streamlined property registration processes and clear ownership laws can also increase household wealth, unlock access to credit to help smooth periods of shock, encourage investment in property management and allow households to flee and rebuild after disaster.

Preemptive delineation of public and private space also allows for the protection of environmentally sensitive areas, such as wetlands, riverbanks, and public open spaces (Klaus, 2024). By safeguarding these areas early in the planning process, cities can reduce the creation of flood prone settlements, urban heat islands, and other localized, manmade environmental challenges. Furthermore, protecting these spaces improves livability, creating green areas for recreation and enhancing quality of life for residents.

More research is needed to generate basic risk exposure data, which most cities lack; this is a necessary input for urban expansion planning. It is also crucial to better understand how the morphology of cities impacts climate vulnerability, particularly given the multi-faceted nature of vulnerability. Understanding the specific climate risks faced by these communities, such as flooding, heat waves, and water scarcity, is also crucial for developing targeted adaptation strategies and informing urban expansion planning projects. Finally, establishing robust indicators and methodologies to measure and monitor progress toward climate resilience in expansion zones is vital to track the effectiveness of interventions and ensure that no one is left behind in the transition to a more sustainable and equitable urban future.

Sample Research Questions

- **How do climate-related risks intersect with informality?**
- **How can urban expansion planning mitigate environmental degradation?**
- **Does urban expansion planning improve households' ability to withstand and recover from climate-related shocks?**
- **What type of urban expansion techniques are most effective for mitigating climate- and environment-related risks in different contexts?**

3. Conclusion

The challenges facing African cities are immense, but so are the opportunities. With urban populations in Africa expected to triple by 2050, cities have a limited window of time to plan for future growth and ensure that their expansion is sustainable, inclusive, and economically beneficial. However, urbanization across SSA remains largely unplanned. This is largely due to institutional barriers, such as weak land administration systems, outdated and complicated building regulations, low government capacity, and significant resource constraints. As African cities continue to rapidly expand outwards, the proliferation of informal settlements in the urban periphery decreases access to economic opportunity and increases environmental vulnerability. Without intervention, these patterns will become further entrenched, making it even more difficult and costly to reverse their negative effects.

Urban expansion planning offers a proven, pragmatic, scalable solution to these challenges. It is a vital tool that cities can use to lay the groundwork for a prosperous future. By prioritizing foundational interventions like road grids and the protection of open spaces, African cities can guide their growth in ways that promote accessibility, efficiency, and resilience, improving the quality of life for all residents. Evidence from secondary cities in Ethiopia suggests that proactive planning can significantly improve access to essential services and jobs in the city center. As a result, incomes and living standards in the expansion zones have increased substantially. However, more research is needed to improve projection and planning methods, adapt expansion planning to diverse local contexts, and identify the governance and policy reforms necessary to support effective interventions.

As the research arm of the Urban Expansion Planning (UXP) at the AUL, the Urban Expansion and the Periphery research cluster will focus on generating actionable insights into the regulatory, market, and environmental dynamics that shape urban expansion in African cities. Over the next several years, the agenda will proceed along the three themes outlined in this paper: Regulation, Land Markets, and Infrastructure Expansion; Mobility, Opportunity, and Economic Development; and Urban Sustainability and Resilience. Over the next three years, the research cluster will produce outputs that directly inform policymakers, urban planners, and development practitioners. These will include policy briefs and reports that synthesize research findings into clear recommendations, while academic articles and case studies will document and analyze lessons from cities implementing urban expansion planning.

The time to act is now—before the window of opportunity closes and the challenges of urbanization become too costly to reverse. The rapid urbanization of Africa is one of the defining transformations of the 21st century, and how cities grow today will shape economic and social outcomes for generations. By scaling urban expansion planning and conducting further research to refine the approach, we can help ensure that urban growth strengthens, rather than undermines, prosperity and resilience. Ultimately, how we manage urban growth over the next 75 years will define the future of the continent. We must harness the innate potential of cities to drive humanity forward by laying the foundations for sustainable, inclusive urban growth in Africa. A good urban plan, established early on, is the framework cities need for long-term prosperity.

A Note from the AUL

At the AUL, we not only seek to provide groundbreaking research on the spatial dynamics of urban growth in Africa, but also to develop policy solutions which are practical, evidence-led, and context relevant. The research conducted under the Urban Expansion & the Periphery cluster directly feeds into and informs the AUL's work implementing Urban Expansion Planning (UXP) across multiple municipal government partners and helping measure and evaluate outcomes to further inform policy decisions.

Acknowledgments

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