This study analyses the spatial expansion of Kigali city, the neighbourhood patterns and key urban characteristics that impact its citizens.

It explores evidence on (i) city growth and land-cover change, (ii) demographic, socioeconomic and environmental attributes, (iii) neighbourhood types and socio-spatial categorisation, and (iv) education and health services.

KEY FINDINGS

- Kigali has experienced significant demographic and spatial growth in the last 20 to 30 years, which has largely been driven by internal migration and natural increases in the population. Built-up areas of the city have increased from 25km² to 115 km². However, rapid and uncontrolled urbanisation is causing a decline in adequate housing.

- The study identified 130 neighbourhoods, categorised into planned, mixed and unplanned neighbourhoods that reflect the socio-spatial profile and income group of residents. A fourth, mixed-use category was also identified.

- Compared to a national rate in Rwanda of about US$720 per person per year, Kigali’s residents have relatively high household income per capita of more than US$1,000 per person per year. Poverty levels have decreased considerably over the last 10 years, employment rates have increased and over 70% of urban residents have access to basic amenities.

- Kigali has responded positively to Sustainable Development Goal (SDG) 4, target 1, which calls for universal free, equitable and quality primary and secondary education. The city’s success can be attributed to the fee-free 12 basic education (12YBE) policy implemented since 2012. Investment in infrastructure has improved access to health services in Kigali too. However, in both sectors, disparities are evident in terms of quality and service delivery based on socioeconomic groups.
About the study

This study\(^1\) analyses the process of spatial expansion of Kigali, the distribution of its neighbourhoods and key urban characteristics.

Kigali is the capital city of Rwanda and the largest urban area in the country with more than 1.6 million inhabitants residing over 730 km\(^2\) (of which 1.2 million live in built-up areas).\(^2\) The city is undergoing a modernisation process through the rejuvenation of commercial centres, investment in infrastructure and improvement in urban service delivery.

Kigali is now known to be one of the cleanest and fastest growing cities in terms of economic opportunities and infrastructural development in Africa and its citizens have seen relative improvements in their socioeconomic conditions, education and health. But, as in other cities across Rwanda, Kigali is characterised by rapid urbanisation, land scarcity, strict construction regulations and also an intensity of unplanned settlements. This has resulted in uncontrolled urban sprawl that affects the distribution of quality basic amenities.

Remote sensing imagery has been used to quantify urban growth in Kigali over time. The objective was to study and describe the nature and pattern of urban sprawl over a 30-year period (1987–2018) that has been marked by rapid urban growth. Kigali’s neighbourhoods have been analysed using a mixed-methods approach, namely: (1) a participatory approach consisting of field observation of the neighbourhood fabric and interviews with residents about the history of the city, and (2) a remote sensing-based approach to digitalise neighbourhood boundaries on different google images. Data on urban characteristics and access to services have been drawn from secondary sources\(^3\) – a deep exploration of these aspects will be conducted in the next stage of this study.

Research results

Changing patterns of land cover, urban sprawl and population density

Due to an increase in urban activities, Kigali doubled in spatial terms during 1987–1999 and 1999–2009, while there was a more gradual change in 2009–2018 (see Figure 1).

The average annual growth rate between 1987 and 2018 is almost 10%. The land-cover trends revealed in this study show that urban expansion has had an impact on the natural environment in Kigali. Most of the agricultural land visible in spatial images from 1987 had been transformed into built-up areas by 2018. Likewise, forested areas of Kigali reduced by half. In large part, the demand for land has been driven by the construction of many administrative institutions, schools and industries built in the last 30 years. Moreover, residents have constructed bungalows instead of high-rise apartments, while new sub-centres of the city have been created too.

Our analysis indicates a total new urban area of 90 km\(^2\) in Kigali by 2018. In 1987, the densely built-up areas were located near the city centre, while in the following years settlements started to appear in the hinterland from one hill to another, leaving wetlands in between. By 2018 the built-up area was denser in Gasabo District at 40.60 km\(^2\), compared to 12.52 km\(^2\) in Nyarugenge District and 20.36 km\(^2\) in Kicukiro District. This shows some degree of dispersion.

Kigali’s rapid spatial expansion is a consequence of demographic growth in the city since Rwanda’s Independence in 1962, driven by internal migration as the population searched for jobs. The city also experienced unexpected demographic growth during 1990–2000 caused by spontaneous waves of immigrants related to the liberation war and genocide perpetrated against the Tutsi. Since then, the urban population has kept on growing, propelled by rural–urban migration coupled with natural growth.

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Figure 1: Land-cover trends in Kigali city (1987–2018)
Key urban characteristics

Kigali has rapidly urbanised throughout the post-genocide period.

The population doubled from 603,049 people in 2002 to 1,203,725 in 2017, reaching an average population density of 1,552 inhabitants per km². Across the five sectors within the inner-city area of Nyarugenge District we observed population densities of more than 10,000 inhabitants per km², although Gitega sector had the highest at 24,482 inhabitants per km². High fertility rates and rapid flows of rural–urban migrants – the majority being young people aged 20–40 years old – are the two main drivers of population growth in Kigali. Compared to an average national population growth rate of 2.6% since the last census in 2012, Kigali has seen growth of 4.5%.

On socioeconomic characteristics, most key economic indicators for Kigali show, on average, a notable positive change between 2011 and 2017. The level of consumption per capita increased by 8% roughly, and annual household income improved by 29.3% over the same period. Furthermore, the rate of employment rose by 4% and poverty levels dropped by 6.5% on average. At district level, the differences in employment rate are marginal: 54.3%, 52.9% and 53.3% in 2012 for Nyarugenge, Kicukiro and Gasabo Districts, respectively.

Regarding housing and basic amenities, we observed considerable changes during 2011–2017. Four main housing types were identified: 1) planned urban housing, 2) clustered settlements, 3) spontaneous or squatter settlements, and 4) dispersed housing types. The first two are considered adequate housing, and the remaining two are qualified as inadequate. The planned and also spontaneous housing types are predominant in urban sectors, and the dispersed and clustered types are predominant in suburbs and sectors with rural characteristics.

At city level, the rate of adequate housing declined from 66% in 2011 to 50% in 2017 due to the spatial expansion of spontaneous settlements. Land is expensive in the inner-city areas and construction costs are quite high, therefore more people opt for affordable living in the suburbs and peri-urban areas. A higher proportion live in rental accommodation (62% in 2017) than own their home (38% in 2017). Access to safe drinking water dropped from 97% in 2011 to 89% in 2017, while access to adequate waste disposal increased from 50% to 76%, and access to clean energy for cooking increased from 1.3% to 11.3%.

The socio-spatial identification and distribution of neighbourhoods

We analysed the physical structure of neighbourhoods in terms of site occupancy (planned or unplanned), housing types and building materials, topography, road network and residential density, and basic services and infrastructure. A total of 130 neighbourhoods were identified in Kigali, including 121 residential neighbourhoods and 9 mixed-use quarters (mostly for businesses).

The residential neighbourhoods comprise three main categories: 1) 44 planned neighbourhoods, 2) 42 unplanned neighbourhoods, and 3) 35 mixed or semi-planned neighbourhoods. Planned neighbourhoods are characterised by clearly separated and demarcated plots, durable buildings constructed according to particular standards, and low residential and population density (2,000 inhabitants per km²). Unplanned neighbourhoods are characterised by high land scarcity, houses concentrated on plots below the minimum legal size, and a high population density (10,000 inhabitants per km²). Construction materials and techniques in unplanned neighbourhoods are non-durable, and the neighbourhoods lack adequate infrastructure and services. Mixed neighbourhoods have both planned and informal settlement areas that have progressively merged either in peripheral rural areas transferred to the city boundaries or informal urban neighbourhoods that have gradually upgraded with paved roads, newly built or renovated houses, and the provision of water and electricity facilities.

In terms of spatial distribution, all neighbourhood types are scattered in the city. However, there are areas of the city that are dominated by particular types. For instance, mixed neighbourhoods are most common in Kicukiro District, planned neighbourhoods in Gasabo District (specifically in Kimironko, Remera and Kimihurura sectors), and unplanned neighbourhoods at the edge of the city.

Another interesting observation is the presence of a small unplanned neighbourhood around each planned neighbourhood in the inner city and also the presence of large unplanned neighbourhoods at the edge of the city. This is because when land is expropriated for a planned residential project, not all expropriated families leave the area. Instead, those who rent and those who receive low compensation use their limited resources to create a new unplanned neighbourhood in the surrounding zone. This is the case in Nyagatovu and Kibiraro – Nyagatovu has been a destination for families expropriated from Kibagabaga and Kimironko, and Kibiraro a destination for those expropriated from the modern and luxurious Nyarutarama. The large unplanned neighbourhoods in the city suburbs and peripheries indicate that the city has expanded informally – to build a house without authorisation in
the inner city is currently too difficult due to the strict urban planning regulations and control and implementation of the Kigali City Master Plan, therefore informal neighbourhoods have emerged in the peripheries.

From our analysis we find that the neighbourhood categories reflect five wealth groups, ranging from the poorest to the richest: lowest-, low-, middle-, upper-middle and high-income households. People in the lowest – and low-income groups mostly reside in the unplanned neighbourhoods. Middle-income households mainly occupy the mixed and a few planned neighbourhoods, while most upper-middle – or high-income groups occupy planned neighbourhoods. About 50% of Kigali’s neighbourhoods fall into the low-income category, followed by middle-income (23%), upper-middle-income (8.5%) and high-income (6.9%).

This trend is also evidenced in the average household incomes across the neighbourhood types. Planned neighbourhoods have an average household income of Frw 580,160; mixed neighbourhoods of Frw 287,870; and Frw 101,730 for unplanned neighbourhoods. The monthly income for about 77.5% of households is more than Frw 300,000. However, only 3.5% of households in informal neighbourhoods earn as much as this: the majority (69.7%) earn less than Frw 100,000.

Our study of the housing typology in Kigali shows that 74.2% of houses in planned neighbourhoods are either one-storey houses (62.9%) or modern single-storey (11.3%), compared to only 9.4% single-storey houses in informal neighbourhoods. In regard to amenities, the rates of access to water at home stand at 88.7% for planned neighbourhoods, 75.0% for mixed neighbourhoods and 40.1% for unplanned neighbourhoods. In the same order, the rates of use of a flush toilet are 96.8%, 27.5% and 6.4%, respectively, while adequate waste disposal rates are 91.9%, 57.5% and 31.7%, respectively.

### Service delivery for education and health

Kigali city has registered a remarkable increase in school infrastructure and its student population over the last decade.

Student attainment increased to 88.6% for primary schooling, 38% for secondary education and 11.3% for tertiary education due to implementation of fee-free Nine – and Twelve-year basic education in line with SDG4. However, Kigali faces a serious challenge of class overcrowding (more than 60 pupils per class) in public and government aided schools in densely populated low-income neighbourhoods and peripheral areas of the city. This has led to a 25% increase in the provision of private schools, which are costly but have moderate class sizes (30 pupils on average). These private schools are located in or around the planned neighbourhoods and are only affordable for children from medium – and high-income families, hence the threat to principles of equity and inclusivity in education.

On health, infant mortality rates declined in all districts in Kigali between 2010 and 2015. The number of health facilities – particularly health posts – increased from 0 to 70 during the period 2009–2018. Such facilities have contributed to a decrease in the average time for Kigali’s residents to reach their nearest health centre from 55.9 minutes in 2006 to 31.4 minutes in 2017, and to an increase from 37.9% of residents who attend a medical consultation when they are ill to 59.2% over the same period. Residents in affluent neighbourhoods enjoy medical services from private clinics, while residents in lower-income neighbourhoods access services via public health centres or health posts.

### Way forward

The city of Kigali is growing both demographically and spatially.

Significant developments are evident in new business infrastructures and high per capita household income compared to that at the national level. The employment rate has increased and poverty has reduced. Housing facilities and basic amenities have improved too. However, despite progress in terms of urban planning, a large proportion of the population still live in unplanned settlements. Sustainable strategies are needed to manage urbanisation to reduce informal settlements, to reduce unemployment further, to lessen the strain on available services and, consequently, to improve the living environment for the large majority of urban residents.
This paper summarises key findings of a report on the city as part of an international comparative study coordinated by the Centre for Sustainable, Healthy and Learning Cities and Neighbourhoods (SHLC). The wider study examines urbanisation and sustainable development in 14 cities in Africa and Asia and this part explores patterns of neighbourhood distribution and changing socio-spatial structures in response to recent urban expansion and migration. Geographic information system (GIS) data and remote sensing image analysis have been used to explore land-use changes and urban sprawl at city level and official statistics such as the population census and other secondary data have been used to map internal structural changes.


1 US Dollar = 969.63 Rwandan franc (Frw) (using a conversion rate as at 23 September 2020).

Health posts are a means of reaching out to the community. They are located far from health centres and provide basic health services to people, including curative outpatient care, child immunisations, growth monitoring for children under five years, antenatal care and family planning counselling, health education and a few laboratory tests (particularly rapid tests).

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Cover photo: Kigali, Rwanda. A wide view looking down on the city centre with Pension Plaza in the foreground. Credit: Shutterstock, Jennifer Sophie.

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About Us

SHLC aims to strengthen capacity to address urban, health and education challenges in fast growing cities across Africa and Asia. SHLC is an international consortium of nine research partners, as follows: University of Glasgow, Human Sciences Research Council, Khulna University, Nankai University, National Institute of Urban Affairs, University of the Philippines Diliman, University of Rwanda and the University of Witwatersrand.

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