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Impact of zoning-based on architectural designs towards affordability accommodation for the urban poor in Kigali city of Rwanda.

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## **ABSTRACT**

In Africa, the linkages between zoning planning and affordable housing have not been adequately assessed. In scenarios where zoning system has been enforced for a long time, such as in the United States, it has been often labelled as exclusionary due to how it limits the poor to access housing. With zoning being at the heart of the current planning system in Rwanda, this research aims at examining these linkages in an emerging urban setting such as Kigali city. This study employed a mixed-method approach to assess how the master plan and zoning requirements affect housing cost and the ease of accessing housing for low-income households. Results reveal a total house supply gap to 30,000 units between 2012-2020 of which more than half is affordable housing. While zoning code requires the use of primarily imported materials which increases the cost of housing, more than 70 per cent of residents earn too minimal income to qualify for traditional mortgage loans. Therefore, the case of Kigali city emphasizes the mismatch between zoning assumptions and underlying social and economic conditions. Moreover, the euphoria to meet master plan objectives encourages the conversion of prevalent informal settlements into high-end market neighborhoods overlooking the negative impact on affordable housing. This study suggests the relaxation of zoning regulations for certain income thresholds, re-defining affordability to match the local context and generating housing affordability indexes regularly to inform the government's urban housing strategies

**Keywords:** zoning, planning, design, architectural, housing

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## **1. BACKGROUND**

The global research in planning and urban geography has been concerned with establishing the relationship between zoning regulations and the affordable housing problem (Harney, 2009; Glaeser & Gyourko, 2003; Monkkonen, 2013). Researchers argue that excessive land-use restrictions may increase house prices and hence make it harder for urban communities with limited income to access decent housing (Monkkonen, 2013). Despite being widely regarded as social merit (Leishman & Rowley, 2012), access to housing remains a crucial challenge for a significant number of urban populations. The latest report on world cities development estimates 881 million people currently living in slums in developing countries (UN-HABITAT, 2016). Similarly, the same report argues that 1.6 billion people will face housing deficiencies by 2025 (UN-HABITAT, 2016). In this respect, in the efforts to examine the potential causes of the housing problem it has been regarded by various scholars as essential to trace the link between the strictness of zoning-based planning and declining levels of housing affordability.

At the same time, the last few decades have seen many developing countries undertaking policy reforms which gave way to modernist planning approaches mostly involving master plans and zoning regulations in an attempt to control

Urbanization (UN-HABITAT, 2009). To this end, the common reason for adopting zoning in many contexts has been often described as the acknowledged need to reorganize urban spaces into well planned, and segregated land uses and to increase land productivity by integrating mutually beneficial land uses (Lai & Chung, 1994; Fischel, 1995). There is also a belief that such an approach can also offer practical solutions against common urbanization challenges such as the proliferation of informal settlements and urban sprawl particularly in cities of the global south (Njoh, 1995).

However, the fundamental problem with zoning regulations has been allegedly its tendency to exclude urban low-income communities by imposing minimum housing standards out of their reach (Harney, 2009). For instance, in countries where such principles are highly used as the United States, zoning approach to planning has been described as exclusionary and increasing the cost of housing (Ikeda & Washington, 2015). To this end, Glaeser & Gyourko (2003), in their study appraising the impact of building restrictions on housing affordability across U.S. cities, demonstrated a close relationship between measures of zoning strictness and high land prices and housing costs. More recent investigations have also endorsed this correlation. Furthermore, Harney (2009), in his study examining zoning effects on housing

supply, established that zoning regulations significantly stimulate an increase in land prices by restricting the delivery of additional land in the formal market.

## **2. METHODS**

This research applies mixed-methods, which relates to the analysis of social, economic and spatial phenomena. This study analyses only secondary data. Besides, it uses both quantitative and qualitative data gathered from secondary sources including textbooks, academic journals, working papers, organizations reports, policy documents and laws and other common forms of publications. The analysis component of this research applies *Discourse analysis* (Potter & Wetherell, 1994) and *cost analysis* (Mayer & Somerville, 2000). Mixed-methods approach suits the nature and context of this study (figure 3.1). Use of multiple methods approach can help to neutralize biases inherent in particular methods, while also it allows easy triangulation of different data sources (Creswell, 2003). In this study, qualitative research helps to understand perspectives of policies, laws and plans on access to housing. In contrast, quantitative research offers an account on the extent of the affordable housing problem and how it relates to current policy and regulatory frameworks. More precisely, as Bryman (2016) suggests, in this

study, qualitative data is used to illustrate quantitative findings.

## **3. RESULTS**

In Rwanda, the post-genocide period was marked by rapid urban Urbanization, mainly taking place in Kigali city. In the presence of transitional institutions and poor infrastructure, urban growth has consequently taken place in a spontaneous and uncontrolled manner (Manirakiza, 2012). As a result, this has given way to the spread of informal settlements. However, as part of the efforts to redress this situation, the central government has passed a series of policies, laws and strategic plans to ensure urban renaissance and controlled spatial development. The policies are examined in detail under this section in an attempt to capture their perceptions on provision and access to affordable housing.

### **House market situation**

#### *1. House market composition*

In Kigali, the housing market is mainly broken up into rental housing and owner-occupation housing. Renters form the largest proportion of Kigali residents accounting for 53 per cent

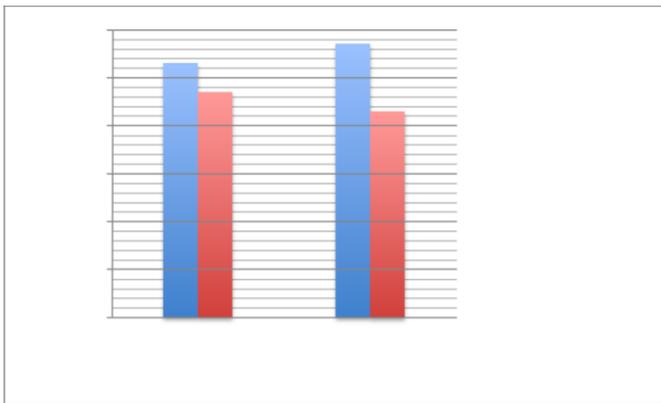
compared to 47 per cent for owner-occupiers (MININFRA, 2015). Most of the renters consume informal housing with a share of 57 per cent of the total tenant households in informal areas. With the majority of renting tenants (approximately 83%) housed in areas located around the central business district, these very same locations are the most likely to undergo expropriation in the process of enforcing the master plan.

Generally, this is due to the availability of cheap labour, land and lack of building restrictions outer the urban boundaries, which in turn makes the housing cost mostly affordable

*2. Extent of the affordable housing problem*

Housing shortages in Kigali have reached the highest record in the past two decades. In a housing market survey undertaken by Planet Consortium (P.C.) in 2012, it has revealed that Kigali needs at least 31,000 house units each year to satisfy current demand compared to only 1,000 units annual supply in the formal market. More importantly, the same study indicated that affordable housing constitutes the largest proportion of house demand corresponding to 54.11 per cent of the city’s population whereas mid-range housing, social housing and premium housing follow with 32.8%, 12.62% and

**Figure 1: Housing tenure structure for the city of Kigali**



Unlike in Kigali, the tenure structure at the country level is predominantly owner-occupation. The latter accounts for 80 per cent, whereas renting households are only 15 per cent of the total population (MININFRA, 2015).

	<b>New Dwellings (Projections for 2012---22)</b>	<b>Dwelling units</b>	<b>%</b>
1	Social Housing	43,436	12.62%
2	Affordable Housing	186,163	54.11%
3	Mid---range Housing	112,867	32.80%
4	Premium Housing	1,601	0.47%

TOTAL	344,067	100%
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#### 4. DISCUSSION

Kigali is the primary urban centre in Rwanda; it accumulates the largest share of employment. The demographic structure of its population further characterizes this. About 73 per cent of residents are under the age of 30 (REMA, 2013), and this could be explained by a high concentration of economic activities, which attracts young people to the city. To this end, the labour force<sup>9</sup> in Kigali forms 79.3 per cent of the population (NISR, 2016b). The city’s major employment sectors include agriculture (24%), tertiary sectors such as utilities and financial services (21%) and trade forming 20 per cent. Other employment areas include public sector, transportation and communication, construction and

manufacturing (see table 4.8).

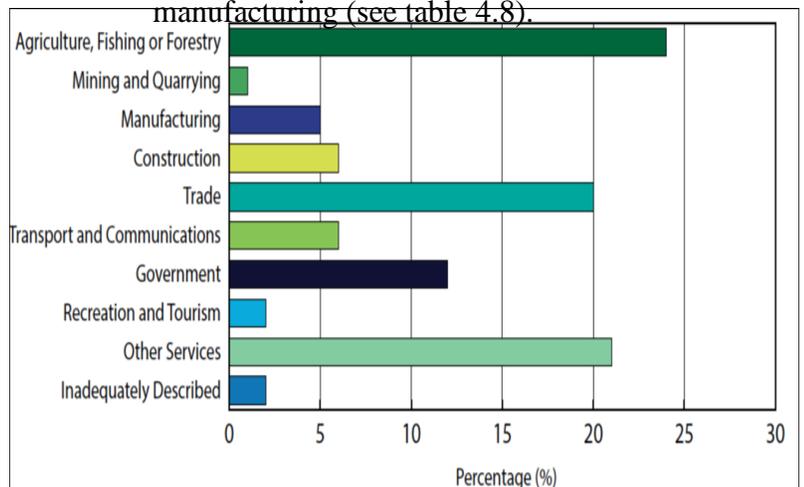


Figure 2: Employment breakdown for Kigali city

Table 1: Projected housing supply for Kigali 2012-2020

Figure 4.4 The pyramid of a housing supply gap in Kigali. (Planet consortium, 2012).

Against this background, affordable housing is clearly among, if not the most ultimate challenge to the city’s urban development vision. Further, demonstrated by how the issue is widely reported among international news outlets (see for example Rosen, 2015) and local media (Anangwe, 2016) with high-ranking government officials repeatedly quoted emphasizing that addressing the affordable housing issue is the city’s prime focus.

In this respect, this study suggests that the causes of acute housing shortages in Kigali be viewed in two dimensions. One is the rapid and spontaneous growth of the city during the past two decades, as was demonstrated in the previous section. Second and most important is allegedly the mismatch between assumptions of the master plan and zoning requirements and the median average income of the city’s households. To this end, before a detailed analysis of the latter cause is presented in the last two themes of this chapter, the next section offers a snapshot of the government interventions apropos affordable housing.

On the other side of the spectrum, levels of unemployment in Kigali are on the rise. A recent countrywide pilot study on employment reported the unemployment rate of 13.2 per cent at the country level (NISR, 2016a). The same study indicates that the unemployment rate is higher in Kigali and other urban areas (15.9%) compared to rural areas (12.6%). Also, a higher unemployment rate is recorded among those aged between 16 and 30 (15.9%) compared to adults (10.6%). From these data, it is clear that unemployment threatens a considerable portion of the young and active population of the city.

### **3. Poverty and inequality**

In the last 20 years, tremendous progress was made regarding poverty reduction. For example, during the 2005-2011 period poverty has dropped by 11.8 per cent at the country level (NISR, 2012c). Despite this decline, however, poverty is still prevalent and widespread in both urban and rural areas. In general, 45 per cent live below the poverty line in Rwanda while in Kigali city low population are 22 per cent (World Bank, 2015). From a geographical point of view, poverty is predominant in rural areas compared to urban areas. Besides, while agriculture<sup>10</sup> is the leading source of income for the majority of the population, similarly high incidence of poverty is found among those relying on this occupation (NISR, 2012c).

### **4. Extent of access to homeownership**

Based on the literature review, housing affordability was defined in terms of capacity to buy/rent a house (purchase affordability) with their resources or ability to pay back loan services (repayment affordability). This section attempts to capture the extent of access to finance as a proxy measure of purchase affordability.

From the perspective of financial inclusion, in Kigali, approximately 37 per cent of people hold a bank account, and among these, only 21 per cent have a savings account (MININFRA, 2015). Also, at the national level, only 4 per

**Figure 3: Kigali city master plan**



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cent borrows money from formal financial institutions purposely to buy or build a dwelling unit (Finscope, 2016). To this end, access to finance and saving culture is clearly still at a low level and does not consequently make it easy to access housing finance.

In this context, the cheapest subsidized house unit would cost Rwf 6.3 million, and this is the ceiling house cost within reach of those with a monthly income of less than Rwf 300,000 (see table 4.10). Therefore, for households within the first income quintile to access housing finance, it requires specialized finance mechanisms out of the traditional mortgage housing finance configuration because otherwise they are constrained by insufficient income to meet formal housing costs.

## **5. CONCLUSION**

In this dissertation, I highlight the causal relationship between zoning based planning systems and declined housing affordability. I consider Kigali city, the capital of Rwanda as one of possibly many cases studies across African cities suitable for examining the linkages between master planning and zoning enforcement and the lack of housing options for low and moderate-income urban residents. Previous studies assess the impact of land use and building restrictions and housing affordability and massively found a strong correlation between zoning strictness and rise in

house costs and prices. The literature presents strong evidence from cities across the U.S., Brazil, Malaysia and Cameroun in Africa.

Also, in this dissertation, I hint at the transfer of planning cultures as a significant foundation of planning systems. In general, such diffusion of urbanism models takes place in a broad context of transnational cooperation and exchanges of best practices in planning. Although the rationale behind this has been primarily critiqued, it is not uncommon for cities to emulate developments believed to be a success elsewhere with the hopes to make a similar impact in these urban settings. In this way, in Kigali city, the on-going planning reforms, including the new master plan and zoning ordinances, appear to be strongly influenced by the Singaporean urban model.

The intention is to trace the linkages between zoning and housing affordability. Findings from the case study illustrate that the city is committed to addressing the effects of uncoordinated Urbanization, which reigned its landscapes for many decades. This is reflected in the existing policy and regulatory frameworks, which encourage the city's authority to undertake large-scale gentrification projects to meet the master plan's outlook and to get rid of informal settlements.

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In terms of housing development, the master plan and zoning requirements are clear for different residential zones. However, there is a discrepancy between their assumptions and existing social and economic conditions, which, as a result, implies a considerable cost implication on housing. With more than 73 per cent of the city's households earning as less as Rwf 300,000, such monthly revenue would only afford a housing unit worth Rwf 6.3 million. Without subsidies, there is nowhere in Kigali such amount can build a house when a simplified cost analysis suggests that the cheapest unit required by the zoning code would at least cost Rwf 16 million. Therefore, I would argue that despite the envisaged long-term benefits under the current master plan and zoning code implementation, they don't respond adequately to the immediate housing needs of the low-income communities. Instead, they seem to undermine other traditional means of access to affordable housing by these income groups.

Assessing aspects of zoning planning and housing affordability is crucial in any urban setting and particularly in the case study area. Zoning planning has gained ground in countries with the increased need to segregate incompatible land uses and to control urban growth. On the other hand, while access to housing is mostly recognized as a fundamental

human right; similarly, it forms the main household expenditure. Hence, a minimal rise in housing cost can make life in the city harder, particularly for the poor with direct consequences likely to be consumption of either substandard housing or too expensive housing package.

## 6. LIST OF ABBREVIATIONS

<b>NPCA</b>	National Precast Concrete Association
<b>ASTM</b>	Standard Specification for Concrete Aggregates
<b>BS</b>	British Standard
<b>QCE</b>	Quality Control Engineer
<b>NSCP</b>	National Structural Code of the Philippines
<b>S/no</b>	Number of Series
<b>NDA</b>	Net Developable Area
<b>NST</b>	National Strategy for Transformation
<b>PCE</b>	Planned City Extensions
<b>PSUP</b>	UN-Habitat's Participatory Slum Upgrading Programme (PSUP)
<b>REMA</b>	Rwanda Environment Management Authority
<b>RHA</b>	Rwanda Housing Authority
<b>ROWs</b>	Public Rights of Way (Public Domain)
<b>RwaGBO</b>	Rwanda Green Building Organization
<b>SWM</b>	Solid Waste Management

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UPC Rwanda Urban Planning Code

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### Authors' contributions

J.R. conceptualize the idea, and both others contributed equally after that.

### Authors' affiliation

Both authors are affiliated to Distance production House University/ IST Burkina Faso.

### Conflict of interest

We declare no conflict of interest

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