The Unsustainability of Urban Habitat Transformation:
A Case Study of Kileleshwa in Nairobi, Kenya

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Abstract

This paper interrogates the issue of sustainability of the market-driven urban residential transformation of Nairobi through a case study of Kileleshwa, a residential neighbourhood located in the western suburbs of the city. The paper examines the impact of the ongoing transformation from low-density housing to higher density high-rise apartment housing on the sustainability of the urban habitat. This is predicated on an understanding of sustainability in which its components are hierarchically organized to privilege the environmental component over the social and economic ones. The investigation was undertaken qualitatively using the case study of high-rise apartment blocks. This entailed qualitative interviews with key actors implicated in the process of transformation including property developers, the local authority, and residents. Research methods also included visual documentation of the apartment blocks being developed as well as document review of public sector and private sector reports on the real estate sector. The results indicate that the current production of housing in Kileleshwa is unsustainable. This is demonstrated by the inadequacy of the neighbourhood´s infrastructure in supporting the current trajectory of the habitat´s densification. The infrastructural challenges are discussed in detail highlighting the extent to which they are leading to unsustainable transformation. A reframing of the approach to urban development that requires a paradigm shift in prioritizing the environmental component of sustainability and deliberate planning for densification in place of the current ad hoc approach to urban development is also discussed. The paper concludes that sustainable urban development requires both a foregrounding of environmental concerns and the adoption of a holistic approach in the satisfaction of urban needs such as housing with their commensurate physical and social infrastructure. The paper recommends the upgrading of the existing physical infrastructure to support densification, and the redirection of the ongoing urban development towards the more sustainable compact city structure.

Keywords: *Apartment housing, climate change, densification, Kileleshwa, Nairobi, sustainability, unsustainability, urban transformation.*

INTRODUCTION

Long term sustainability is arguably the *zeitgeist* of the 21st century. With the turn of the millennium sustainability has become an important global concern. This is evident in the opening two decades of this century. Calls have arisen to address the growing threat of global climate change particularly due to anthropogenic factors. The issue now features prominently in the international press.

The concerns with global warming and the need to keep global temperatures below two degrees celsius above pre-industrial levels culminated in the signing of the Paris Agreement on climate change in November 2016 (United Nations

Framework Convention on Climate Change [UNFCCC], 2018). This was an acknowledgement by world leaders of the urgency of the matter and the need for concerted global efforts in addressing climate change. Only a year earlier, the United Nation's Sustainable Development Goals (SDGs) had been agreed to at the sunset of the Millennium Development Goals (MDGs) (United Nations Department of Economic and Social Affairs [UN-DESA], 2018a). The 17 SDGs are a deliberate move to place sustainability at the top of the global agenda (UN-DESA, 2018a).

Further, the Katowice COP24 agreement was adopted in December 2018. It will operationalize the Paris Climate Change Agreement in 2020

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(McGrath, 2018). In addition, the New Urban Agenda (NUA) was adopted in October 2016 at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) held in Quito, Ecuador (United Nations [UN], 2017). It calls for a global reconsideration of urban systems and the physical form of urban spaces in the pursuit of, a shared vision for a better and more sustainable future (UN, 2017). In viewing the urbanization of cities, if well-planned and well-managed, as an opportunity for achieving sustainable development, it is well-aligned with SDG 11 that focuses on the sustainability and resilience of cities (UN, 2017).

The seriousness of climate change is underscored by the extreme weather events now featuring regularly in global news headlines. Heatwaves and record temperatures are now an annual occurrence as are extreme wildfires decimating hundreds of acres of forests in various parts of the world. In July 2019, Western Europe experienced an extreme heatwave with the highest ever temperatures recorded in the Netherlands, Germany and Belgium (BBC News, 2019). Hurricanes, cyclones and tropical storms are increasingly grander, more severe, and more frequent across the globe. In March 2019, Tropical Cyclone Idai devastated Mozambique and Malawi when it led to extreme flooding that resulted in the destruction of homes, displacement of thousands of people and at least 60 fatalities (United Nations Office for the Coordination of Humanitarian Affairs [OCHA], 2019). Melting arctic ice has raised fears of sea-level rise that would have catastrophic consequences for heavily populated low lying human settlements, particularly coastal regions. Heavier rainfall with its concomitant floods, property destruction, and loss of life, is now a common occurrence. Drought, water shortage and increasing food insecurity has become a major global concern. In early 2018, Cape Town, South Africa, came perilously close to running out of portable water (Alexander, 2019).

The world is already majority urban (UN-DESA, 2014) with 55% of the global population residing in urban areas in 2018 (UN-DESA, 2018b). However, while this is the case in the global North, the situation varies in the global South. Asia is estimated to be 50% urban with Africa only 43% urban (UN-DESA, 2018b). However, both continents are predicted to account for 90% of the

global urban population growth anticipated by 2050 when the global population is projected to be two-thirds urban (UN-DESA, 2018b).

Sub-Saharan Africa (SSA) is experiencing rapid demographic change and unprecedented rates of urbanization. While the continent's economies are growing, the pattern is uneven with most of the growth occurring in East Africa. The consequence of this is rapid transformation of East African cities. The pace and magnitude of the transformation is rapidly altering the cities in an ad hoc manner, which threatens their viability as sustainable urban settlements. Thus, their current trajectory raises an important question regarding urban sustainability: Is the current approach to urban development sustainable? As will be demonstrated in this paper, the current approach to urban development is not leading to sustainable outcomes. For example, in Kileleshwa, the ongoing densification of housing is straining extant infrastructure.

The paper suggests the need for a re-evaluation of present approaches to development if a shift onto sustainable pathways is to occur. This is done by focusing on habitat transformation in Nairobi, the capital of Kenya and a fast-growing city in East Africa. Of interest is the nature of the processes and outcomes of habitat transformation in relation to the concept of sustainable urban development. Thus, the paper focuses on the transformation of the built environment in a residential neighbourhood and the ways in which the ongoing replacement of low-rise single-family detached housing units with high-rise multi-family apartment blocks is altering the characteristics of the urban habitat and impacting on the long-term sustainability of the urban settlement.

The world is on a trajectory to become two-thirds urban by 2050 (UN-DESA, 2014). With urbanization occurring fastest in the global South, which is still mostly rural (UN-DESA, 2014), it is ever more imperative that a sustainable urban context becomes the focus of development if the future is to be a viable one for present and future generations.

THEORY

The term sustainability while in common use

is itself problematic. There is lack of universal consensus on its meaning and appropriate usage. Thus, it has been deployed in various ways in scholarly discourse on sustainability and sustainable development. Ancell & Thompson (2008), in relation to housing, focus on what they refer to as social sustainability. In this, they view it as including notions of social equity and social justice. Taking a broader perspective, Burton, Jenks & Williams (2003) consider various notions of what a compact city in relation to sustainable development may mean highlighting the different ways in which the compactness of the city, particularly in relation to residential areas, has been inconsistently conceived. On the other hand, Dalgliesh, Bowen & Hill (1997), in relation to affordable housing, bring to the fore the environmental sustainability of housing. They argue that despite new building procurement systems indicating an increasing awareness of sustainability, the concentration is on economic and social sustainability at the expense of environmental sustainability. Dessein et al. (2015) argue for an approach to sustainable development in which culture takes centre stage while Unsworth (2015) suggests features of a sustainable neighbourhood that include durable physical infrastructure, connectivity, and accessibility as well as other supportive services.

Meanwhile, Jabareen (2006) in a comprehensive analysis drawing extensively from sustainable development and environmental planning literature, identifies four types of sustainable urban forms; the neo-traditional development, the urban containment, the compact city, and the eco-city. These various approaches in scholarly discourse differ primarily on the dimensions of sustainability that is emphasized. Nevertheless, the World Commission on Environment and Development (WCED)'s definition of sustainable development is generally viewed as a useful starting point for understanding sustainability. The Commission's 1987 Report, *Our Common Future*, popularly known as the *Brundtland Report*, defined sustainable development as "… development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (WCED, 1987)

In acknowledging future generations, it can be argued that the commission had an eye on long term sustainability. However, the stark reality, though, is that the definition, as we have argued elsewhere (Makunda & Edeholt, 2016), has been misapplied in fronting the economic dimension at the expense of both the social and environmental dimensions of sustainable development. Consequently, the environment has been viewed as subservient to the economy with resultant deleterious effects for long-term sustainability.

Challenging the current use of the term sustainable development, Cuthbert (2006) argues that it is used to refer to how much abuse nature can withstand rather than to how much it should be respected. Cuthbert (2006) decries the lack of a supporting political agenda for the key approaches to sustainability in sustainable urban design which he summarizes as formal solutions supported by appropriate technologies and better management of resources (Cuthbert, 2006).

The importance of the environment in sustainability was emphasized by the late Wangari Maathai, the 2004 Nobel Peace Prize Laureate. In the context of the now expired UN Millennium Development Goals (MDGs), Maathai (2010) argued that ensuring environmental sustainability (which was MDG 7) should have been the goal around which all other seven MDGs were arrayed.

In this paper, sustainability is viewed as hierarchical in the interrelationship between its three key dimensions. The paper suggests that prioritizing the environmental dimension over the social and economic dimensions offers a useful conceptual lens with which to interrogate the issue of sustainability within an urban context. While not negating the importance of the social and the economic components in the understanding of sustainable development, the proposed reframing suggests that privileging the environmental dimension over the others is more likely to lead to sustainable outcomes. The environmental dimension is arguably critical for the long-term viability of human society. As the late Wangari Maathai argued, without human beings, the creatures and plants and trees would flourish; but without those species, human beings have no hope of survival (Maathai, 2010).

The proposed approach to sustainability is summarized in **Figure 1**. This is a reversal of the usual way in which sustainability has commonly been approached. Typically, the economic dimension is, in effect, prioritized over both the social and the environmental ones in actual practice. For instance, Kenya´s Vision 2030 frames the country´s development agenda in economic terms in the articulated aspiration for the country to become a middle-income economy by 2030.
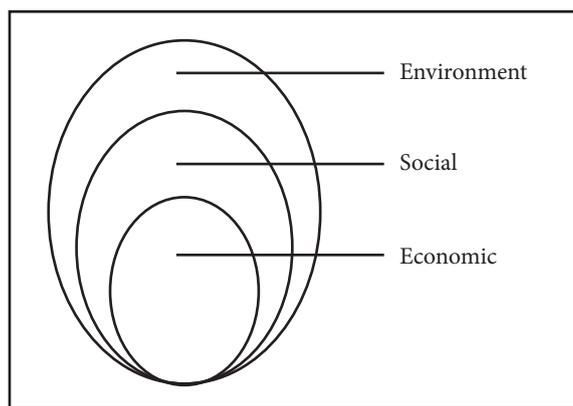

FIGURE 1
Conceptual lens: prioritizing the environment in a hierarchical approach to sustainable urban development
Source: Authors 2018

RESEARCH METHODS

Kileleshwa, a residential neighbourhood in Nairobi, was the site of the investigation. Issues of long-term sustainability were considered in the context of urban development with a particular focus on the mode by which the urban habitat was transforming from low-rise low-density single-family detached housing to high-rise high-density apartment housing.

The approach was qualitative and based on a case study, which made possible in-depth investigation of issues of concern (Yin, 1994). Key informants, who included property developers, county government officials, and Kileleshwa residents, were interviewed. The data obtained was supplemented and triangulated through a review of relevant literature and document review of published reports by the public and private sectors. These included reports on the state of the economy, housing, environment, and official demographic statistics. The Central Bank of Kenya (CBK) and the Kenya National Bureau of Statistics (KNBS)

were the sources of the public sector reports. The two were selected as sources of public data because they are the public agencies mandated to collect, aggregate, and disseminate Kenya's financial and demographic data respectively. CBK also provides regular economic reports and tracks the number of mortgages issued by Kenya's banks. The Kenya Bankers Association (KBA) and three real estate firms; Hass Consult, Knight Frank and Cytonn Investments were the sources of the private sector reports. KBA is the umbrella body for Kenya's banking sector hence was a source of data on the state of real estate from the banking sector's point of view. The real estate firms selected issue regular reports on the state of the real estate sector from property developers and property managers perspectives.

The case study was based on Kileleshwa, an historically upmarket residential neighbourhood situated in the western suburb of Nairobi city. It is located four kilometres from Nairobi's Central Business District (**Figure 2**) and is officially zoned as a low-density neighbourhood with a maximum building height limit of four floors (City Council of Nairobi [CCN], n.d.).

The neighbourhood has been undergoing rapid transformation of its low-density housing stock for more than a decade. Single-story housing units in the neighbourhood are rapidly being replaced by high-density apartment blocks.

The fieldwork entailed multiple visits to Kileleshwa. During the visits, a visual documentation of the high-rise apartment blocks was undertaken using photography. This was augmented by historical and current aerial imagery of the area. Additionally, residents living in an apartment complex were purposively sampled and interviewed for their perspectives on living in the neighbourhood.

The interviews were subsequently transcribed and subjected to thematic analysis from which issues on the nature of the housing transformation in the urban context were identified and discussed. The photographs were subjected to visual analysis and compared with the zoning provisions for the residential area.
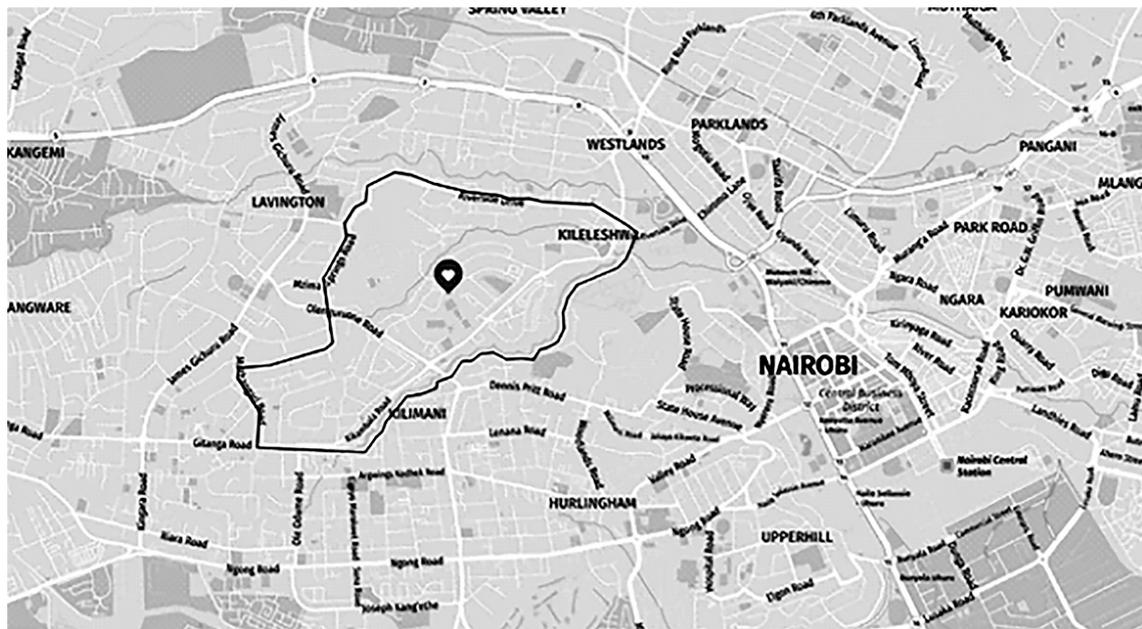
FIGURE 2
Location of Kileleshwa neighbourhood
Source: Adapted from Mapz 2019

RESULTS AND DISCUSSION

Unsustainable Transformation

Since its establishment in colonial era Nairobi, Kileleshwa was a low-density neighbourhood (White et al, 1948). However, the high-rise apartment blocks that have emerged in the neighbourhood in recent years have rapidly altered its character. There is a diversity of apartment blocks in Kileleshwa, exceeding the height limit of four floors (**Figure 3**). When examined from the point of view of the environmental component of the hierarchically ordered sustainability triad (**Figure 1**), it is argued that they are leading to unsustainable outcomes. This is because the high-rise housing developments are undermining this facet of sustainability in stretching the neighbourhood's infrastructural capacity.

This infrastructural challenge was pointed out by the key informants who consisted of Property developers, Local authority [Nairobi City County Government] and Residents. The results of the interviews indicate that property developers were motivated to build high-rise apartment blocks because of the need to make a profit (**Table 1**). The local authority (Nairobi City County Government) viewed the development of apartments as adding to the city's housing stock (**Table 2**). Residents chose to live in apartments in Kileleshwa due to their convenient location and proximity to places of work and schooling (**Table 3**). All key informants emphasize inadequate infrastructure as a key challenge facing the neighbourhood. It is evident in terms of the inadequacy of the water supply, sewage reticulation, storm water drainage, energy supply and road capacity. These issues are discussed in turn below. In addition, the loss of greenery and insufficient amenities in Kileleshwa are also discussed.

Water supply to Kileleshwa is already insufficient in a city with a water shortage. The public water supply infrastructure was not developed for high density housing nor a large population in the residential area. The city's water infrastructure was last upgraded in the 1970s when the city's population was less than one million people. Since then the city's population has quadrupled to more than four million people, to a current population of 4.4 million people in 2019 (Kenya National Bureau of Statistics [KNBS], 2019). As a result, water rationing has been instituted to meet the growing demand. Each sector of the city is now supplied with water once a week in a programme geared towards its equitable distribution (Nairobi City Water and Sewerage Company, 2019).

Consequently, as developers erect apartment

TABLE 1: Property Developer responses to four queried issues

Property Developers	
Issue queried	**Response**
Choice of apartment project	- Able to make returns on investment.
Challenges faced	- Unfavourable interest rates from banks. (rates at 25% - now capped at 14% may be easier to service loans). - Since 2014, land not accepted as collateral by banks. - Corruption in City hall makes it expensive to undertake the developments (it allows the circumvention of regulation). - Contractors doing shoddy work. Compromise on materials and finishes (having to do repairs on water leaks, damaged roofs, piping issues, improper plumbing, poor window seals). - Exorbitantly high cost of land. - National Construction Authority not doing its work properly. They wait for the shell of the building to be completed before intervening hence poor quality of construction.
Thoughts about the types of apartments coming up	- Inadequate infrastructure to support the developments. - Water an issue – development has a borehole. - Sewage being pumped into the river (lack of enforcement by the National Environmental Management Agency [NEMA]).
Comments/thoughts/reflections	- Lack of role models from political leadership - Outdated regulations - Need to make housing construction and provision more affordable. - Need to respect zoning. - Need for decentralization of population. - Should build on non-productive land.

Source: Field survey 2018

TABLE 2: Local Authority (Nairobi City County Government) responses to six queried issues

Local Authority (Nairobi City County Government)	
Issue queried	**Response**
Guidelines for approvals of apartment development	- Ground Coverage = 35 (revised to 75) - Plot Ratio = 1 - Zoning dates back to 1978
Zoning Regulations for Kileleshwa	- Multiple units allowed - Minimum subdivision = 0.05 ha (1/8th acre) - Height Limit = 4 levels + attic - Classified as Zone 4 - Review done in 2006 and 2012 (Currently reconciling the two)
Conditions imposed on the approvals	- Height Limit - Conformity with urban form/character - Parking contained within unit
Owners of the properties in Kileleshwa	- 90% privately owned - A few institutions

Thoughts about the types of apartments coming up	**Negative:** - The address will no longer be appealing once it´s saturated with apartments; no longer be a leafy green suburb. - Vices will come up. - Infrastructure – sewerage and water needs to be upgraded. **Positive:** - It is meeting National and County goals for housing provision. - Area perceived as secure. - Due to population growth, vertical development is the way to go. - It´s development in a serviced area. - Embracing compact city structure.
Challenges faced by the County	- Pressure from developers to go beyond policy requirements – argument is that they cannot break even at 4/5 floors. - Political pressure – developers going through political arm to bypass regulation. - Not having policy instruments that are in tandem with market forces. - Lack of appreciation of the importance of planning in guiding development. - Lack of capacity – few officers to handle the applications, and undertake regular reviews. - Hostility from people served.

Source: Field survey 2018

TABLE 3: Residents' responses to six queried issues

Residents		
Issue queried		**Response**
Location choice factors	Choice of location	- Accessibility, security, convenient location, own the property, proximity to child´s school, urban area with good views, nice place for a child to grow
Children and related aspects	Have children/Number	- Yes, 1; Yes, 3; Yes, 2; Yes, 2; Yes, 1
	Attend school/if so where	- Yes/ Hospital Hill, Parklands; Kianda, Makini, Kyota
	Playground nearby/if so, where If no, where do children play	- Not yet done hence use parking lot; Not available here hence go to Valley Arcade, Carnivore or Thika Road
Mobility factors	Own a car/Number	- Yes/ 1; Yes/ 3; Yes/ 2
Means of travel to work	(Walking, Biking, Bus, Matatu, Car, Taxi)	- Matatu, Car
Social factors	Engage neighbours/where, when, how	- Yes (a few); Informally in corridors; Not yet; No; Yes, once in a while and there is a WhatsApp group
	Events in neighbourhood -which ones/participate in them	- None, no organized meetings

Neighbourhhod factors	Like about the neighbourhood	- Quiet, convenient location, proximity to school, not overcrowded.
	Don´t like about the neighbourhood	- Theft (motorbike thefts), noise from neighbouring pubs, poor state of roads, i.e. potholes, recent break-in due to ongoing repair work, lack of common spaces, lack of children´s play areas, noise from cars at night, loud music from neighbouring restaurant, break-ins due to ongoing construction, too many potholes on the roads, too much traffic.
	Like to see improved, changed, introduced, eliminated	- Leaking sewage, poor service, fixing of roads with potholes, provision of children´s playground, swimming pool, gym, transportation.
	Thoughts on changes from bungalow to apartments	- Good idea because more people are accommodated; Encourages cohesion because one encounters a diversity of people; Infrastructure needs to be improved to accommodate the growing population, i.e. sewage facilities, water, electricity, roads; social infrastructure needed to enable things to work well; Biggest challenge will be the infrastructure – water shortages and burst sewers will be the norm like places on the east of Nairobi e.g. Umoja; The apartments are coming up too quickly and are too many in a block, which will become a crisis at some point; Apartments are very expensive – life is very expensive like Dubai; Don´t mind because it is happening all over; It´s good, the more people accommodated in a metropolitan area the better.

Source: Field survey 2018

blocks, they resort to drilling their own boreholes to augment the inadeqaute water supply. In some cases, this is being done irregularly without official authorization but with potential deleterious effects. A 2016 report by the Water Resources Management Authority (WRMA) indicated that fully two-thirds of Nairobi´s boreholes were sunk without authorization. Out of 6,000 boreholes citywide, only 2,000 boreholes were said to be in the Authority´s database (Lang'at, 2016). And, many of the boreholes violate the minimum spacing of 150 metres required between boreholes (Kinyanjui, 2019). This is apparent with neighbouring apartment developments having their own boreholes. It is a situation that poses some risks. First, is the questionable safety of the water in the unsanctioned boreholes. Second, is the dual danger of subsidence and depletion of underground water reservoirs due to excessive abstraction of water from the city's underground aquifers.

Sewerage reticulation is also a challenge that was highlighted in the interviews with key informants. Kileleshwa was planned as a low-density neighbourhood with single dwelling housing units serviced with septic tanks, which were sufficient for such density. The extant sewerage line is limited. The high-density apartments currently being developed (**Figure 4**) are therefore inappropriate if considered from the point of view of sewerage handling capacity. The ongoing connection of the high-density apartment blocks to the extant sewer system risks breaching its capacity.

Already, serious issues are emerging. In the case study apartment development in Kileleshwa, the developer connected a section of the apartment blocks to a septic tank within the development. This is an unsustainable solution. The septic tank will not only result in costly maintenance due to the need for frequent emptying, its proximity to the borehole increases the risk of contamination of the drinking water supply. The WHO minimum

FIGURE 3
High-rise apartment block in Kileleshwa, Nairobi with a flat roof
Source: Author 2018

FIGURE 4
High-rise apartment block under construction in Kileleshwa, Nairobi
Source: Author 2018

recommended distance between a septic tank and a borehole is 30 metres (Ebri, Emmanuel & Ebaye, 2016).

With the expanding building footprint associated with apartment blocks, is the rising challenge of storm water drainage whenever it rains. The extant storm water drainage was not designed to service high-density buildings. As pointed out by Makunda & Edeholt (2016), flooding is now a perennial challenge in the lower area of Kileleshwa whenever the neighbourhood is inundated during

the rainy season. This is due to the increase in the hard surface area as trees are cut down to make room for apartment blocks with their large plinth areas. The situation is likely to deteriorate considering the extreme weather events associated with climate change.

Other unsustainable patterns are evident in Kileleshwa. Increasing energy consumption is an issue as the demand for electricity rises with the increase in apartment units on plots that were previously occupied by single dwelling units. At minimum, apartment blocks with at least 50 units are being constructed on each plot of land. However, apartment block developments with more than 100 units are becoming increasingly common as the newer apartment blocks are built to a height of 14 floors (**Figure 5**). A power sub-station exists in Kileleshwa but this was not designed to cater for apartments hence lacks the capacity to handle the extra energy demand. Frequent power outages are thus a common occurrence in the neighbourhood.

Vehicular traffic is also a growing concern pointed out by most of the interviewees. It is also observable during the rush hour in the morning and evening. The neighbourhood was not designed for car ownership in a high-density area. Consequently, with the emergence of apartment blocks with residents who own cars, and in some cases more than one car per household, motorists on Kileleshwa's streets now experience heavy weekday traffic. This has not only dire implications for the residential neighbourhood's air quality due to the pollution associated with vehicular exhaust but also increases the number of productive hours wasted in traffic.

One of the more immediate consequences of apartment block developments in Kileleshwa is the loss of greenery through the cutting down of trees. Historically, Kileleshwa is part of the leafy green suburbs of Nairobi. These are suburbs with low density housing on large lots with a high preponderance of mature trees (Freund, 2007). The cutting down of trees to make room for apartments with their larger footprints compared to low-density housing units, is resulting in the loss of an important carbon sink and likely contributing to the city´s heat-island effect.

Moreover, the neighbourhood is rapidly losing its appealing character as a tranquil leafy green neighbourhood (**Figure 6**).

Low-density housing on large lots in Kileleshwa were designed with the appealing feature of each property having its own open space. However, with apartment block developments, open space has been sacrificed as developers strive to maximize the number of units possible on a given plot in order to maximize their profits. For example, in some apartment complexes, children lack open spaces or playgrounds with play equipment. This was a concern raised by interviewed residents who have children (**Table 3**). Hence, they resort to playing on the hard surface driveways which increases their risk of serious injury from falls.

Adult residents also lack communal open spaces. In one apartment complex, when meetings are organized, they are left with no option but to meet in the parking lots within the complex. In effect, parking lots have become the *de facto* open space, however ill-suited they may be for such a purpose. Where a communal amenity such as a swimming pool has been provided, its capacity is an issue as it is insufficient in size to cater for the large number of residents accommodated in the apartment complexes. But, crucially, due to the piecemeal development of apartment blocks on individual plots, the need for a communal public open space for the neighborhood as a whole has been neglected. Additionally, Kileleshwa is bordered by two rivers but these are neither easily visible nor accessible. Some apartment developments have encroached on the riparian reserves of the rivers with the consequent loss of a potential communal public space.

Arguably, the densification of housing in Nairobi's suburban zones such as Kileleshwa is a market-driven phenomenon in which exchange-value is trumping use-value. It is an approach to the urban development of the city that is driven primarily by developers' profit motive as they rush to satisfy an emergent middle class housing need. Brenner, Marcuse & Mayer (2012) discuss the issue of exchange-value (profit-oriented) vis à vis that of use-value (everyday life) in describing how urban space is constantly being shaped and re-shaped under capitalism. In this case, the rapidity

FIGURE 5
High-rise apartment block with a curvilinear façade in Kileleshwa, Nairobi
Source: Author 2018

FIGURE 6
Multiple apartment blocks altering the character of Kileleshwa, Nairobi
Source: Author 2018

and haphazardness with which densification is occurring in Kileleshwa is leading to an unsustainable habitat.

Achieving Sustainable Outcomes

In its New Urban Agenda, the United Nations, provides guidance for achieving the Sustainable Development Goals and provides the underpinning for actions to address climate change (UN, 2016). More than half of the eight key commitments in the agenda have to do with sustainability (**Table 4**).

TABLE 4: New Urban Agenda commitments that touch on sustainability

New Urban Agenda Commitments
- Promote measures that support cleaner cities – issues here include the use of renewable energy, and greener public transportation.
- Strengthen resilience in cities to reduce the risk and impact of disasters – mitigation measures here include better urban planning and quality infrastructure.
- Take action to address climate change by reducing their greenhouse gas emissions.
- Improve connectivity and support innovative and green initiatives.
- Promote safe, accessible and green public spaces – this includes increase in public spaces such as sidewalks, cycling lanes, gardens, squares and parks.

Source: UN 2016

However, as with many desirable measures, the challenge is not only their interpretation but more crucially, their implementation. To be achieveable, this requires the foregrounding of environmental concerns in what is being proposed in this paper as the hierarchical view of the common understanding of sustainable development (**Figure 1**). In this approach to development, environmental concerns, which require a long-term view of development, take precedence over both social and economic ones. This is suggested as a framing that is necessary in order to move closer to sustainable urban development as an outcome.

To consider habitat transformation from a long-term sustainability point of view requires a paradigm shift (Kuhn, 1962 as cited in Meadows, 1999) from an economic-centred market-oriented approach to an environment-centred sustainability approach. This is where the conversation needs to begin if approaches to long-term urban sustainable development are to be pursued.

Political will is also a necessary ingredient in effecting a paradigm shift from the current unsustainable trajectory to more sustainable pathways. Recent efforts by the county government in Nairobi to enforce regulations regarding riparian areas along rivers and their tributaries are a case in point (Business Today, 2018).

Sustainable urban development is the outcome of a deliberate plan (Makunda, 2018). Thus, the piecemeal mode by which densification is occurring in neighbourhoods such as Kileleshwa makes it that much more difficult to achieve desirable sustainable outcomes. With market forces already having a strong foothold in the current unsustainable pattern of urban development, it becomes even more imperative for the relevant planning agencies along with key stakeholders to exert their influence in guiding urban development towards sustainable pathways.

CONCLUSION

In this paper, the current unsustainable trajectory of urban development in Kileleshwa, Nairobi, has been discussed. It has been shown how this state of affairs is leading to unsustainable outcomes. This has been highlighted in relation to the inadequacy of the neighbourhood's extant infrastructure. The position taken in this paper is that the current approach to property development, that is primarily profit-driven, is not a tenable proposition if sustainable urban development is to be achieved. Instead, environmental concerns ought to be foregrounded if the adopted approach is to lead to sustainable urban development. This has been proposed as a hierarchical view of the common understanding of sustainable development that privileges the environmental dimension ahead of both the social and economic dimensions.

The paper has suggested that a paradigm shift is necessary in embracing long-term sustainability in the face of climate change. It will require that the city's governance adopts a broader approach to urban development that holistically considers the needs of all the city's inhabitants while ensuring that these needs, such as the need for adequate housing with its commensurate physical and social infrastructure, are met sustainably. This will require a deliberate plan and strategy for sustainable urban development as opposed to

the ad hoc and piecemeal manner in which urban development is currently being approached.

RECOMMENDATIONS

The ongoing densification of Kileleshwa would be sustainable if it was supported with commensurate infrastructure and structured to lead to compact development, which has been suggested as one of several sustainable urban forms (Jabareen, 2006).

Existing infrastructure for water reticulation, sewage handling, storm water drainage, energy supply, and road network should be upgraded to align with the needs for densified housing. In addition, opportunities made possible by high-rise apartment blocks should be embraced. For example, apartment blocks should be purposely built with flat roofs to accommodate green roofs. They should also be fitted with solar panels to augment electricity supply to the neighbourhood.

Water harvesting features should be incorporated in apartment block designs to collect rain water. Additionally, multi-modal transit should be considered for Kileleshwa as its population increases to a level that can support such a system. And, public open space that is integrated with the neighbourhood's rivers' should be developed as an amenity for the neighbourhood before it becomes over-densified.

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