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A New Frontier in Collaborative Approaches in Sustainable Open Spaces Delivery in Nairobi City

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Abstract

This study aimed to examine the historical loss of public open spaces in Nairobi City, assess the residents' awareness of the importance of the resource and determine the collaborative planning and governance approaches used for delivery of sustainable open spaces. The study design employed the positivist and interpretive approaches. Population sampling was based on the Yamane scientific formula (n=400) from a target population of 4.247 million, applied through random sampling and purposefully sampled key respondents (n=20). The applied research instruments were general and key respondent questionnaires, face-to-face interviews, participant observation and review of documents and maps. The study's unit of analysis was aggregate group scores displayed in percentages, tables, histograms, bar and pie charts. The study results revealed serious loss of public open spaces, residents' awareness of open space benefits and absence of collaborative planning and governance practices. The study recommended new governance structures, higher status for urban planning and sustainable open spaces delivery based on pertinent frameworks achieved through collaborative governance approaches.

Keywords: Collaborative approaches, frameworks, governance, Nairobi City, stakeholders, sustainable, urban open spaces.

INTRODUCTION

Nairobi City was planned within tropical green lands composed of interconnected open spaces of various shapes and sizes. Over the years, these were degraded through excision, privatisation, deforestation and development (Makworo and Mireri, 2011). The critical importance of sustainable urban open spaces has been underscored by the proffered ecosystem services that support life on planet Earth, human health and wellness including means of livelihood (Eisenman, 2013). Already Nairobi City temperatures have risen by 5.3^0C within the last twenty-seven years due to deforestation, over dependence on fossil fuels for transportation and other uses (Oyugi et al., 2017).

The divergent perceptions to urban greening and governance in the global North and South countries have produced cities that are diametrically opposed in aesthetics, income generation, innovativeness, service delivery, way of life, etc. (Guneralp et al., 2018). The former nurture environments discovering ways to improve the quality and quantity of open spaces to better deliver ecosystem services for current and future generations. The latter on the other hand mainly alienate and neglect what was bequeathed to them with no ideas on how to replenish or secure the existing stock (Roy and Braathen, 2017). This could result from lack of knowledge on the importance of urban open spaces.

The study intended to find out whether Nairobi City residents actually have the knowledge on the importance of the open spaces and to examine urban planning and governance approaches applied in the delivery of the resource in Nairobi City.

THEORY

Urban open spaces are key determinants of quality of life and sustainability (Arnberger, 2012). Public open spaces are classified as mainly green areas like parks, gardens, squares, golf courses, sports fields, cemeteries, open spaces within the built environments and blue areas encompassing water

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bodies like rivers, dams, lakes and others. Grey open spaces comprise of streets, roundabouts, footpaths and cycle paths (UN-Habitat 2015; Hunter et al., 2015). Urban open spaces are both in public and private ownership. This study deals primarily with green open spaces in Nairobi City that are in public ownership and are freely accessible.

Scientific studies have portrayed open spaces as having numerous benefits in ecosystem services, enhanced bio-diversity, health, creativity and mental growth in children, wellness, cultural growth and social cohesion while decreasing, mental stress and disorders (Annerstedt et al., 2012; Rakhshandehroo et al., 2015). Physical activities enhanced by facilities within urban open spaces reduce lifestyle illnesses like cardiovascular and heart diseases, various cancers, diabetes, obesity, and dementia; thus enhancing human health and longevity (Lam et al., 2018; Cerin et al., 2017). City green and blue spaces generate pride of place, offer relaxation, attract investment, raise property-values and create employment (UN-Habitat 2017; Lam et al., 2018). Their inadequacy is considered as environmental injustice, which in Kenya contravenes the Constitution (Wolch et al., 2014, Government of Kenya, 2010).

Treed avenues offer attractive landscapes that relieve driving stress, and reduce driver speed and error thus minimizing accidents and fatalities. Wide tree cover enhances biodiversity and generally mitigates urban heat islands, climate change and their serious consequent impacts (Rakhshanderoo et al., 2015; Elmqvist et al., 2015).

Urban open spaces have traditionally constituted critical components of urban planning and comprise a major component of urban sustainability. The World Commission of Environment and Development (1987) defined sustainability as development that meets the needs of the current generation without compromising the capacity of future generations to meet their needs, particularly with regards to natural capital. The three circles, pillars and cooking stones (**Figure 1**) models best illustrate sustainability. The four-pillar sustainability model includes governance as one of the pillars (Stanley et al., 2012).

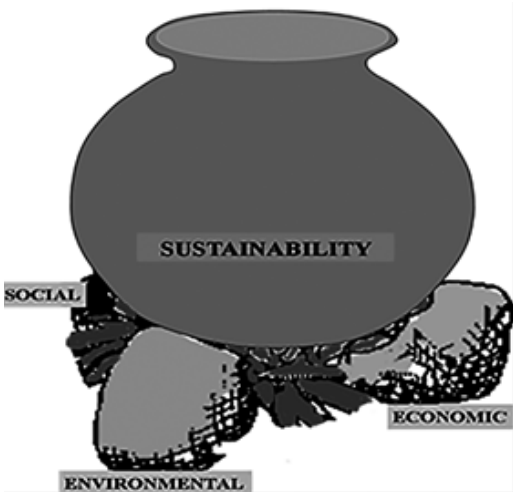

FIGURE 1
The three cooking stones sustainability model
Source: Author 2018

Sustainability necessarily encompasses ethical practices to be adhered to from top to bottom levels of the society particularly in public service and much more in governance and leadership positions. The practice of good professional principles borrowed from governance has to drive sustainability, for without it the goal cannot be achieved. In urban planning, the application of principles of collaborative governance given as facilitation, rule of law, accountability, transparency, innovation and public participation; including the principle of subsidiarity, honesty, proper utilization of resources, and creation of new knowledge, should encompass the involvement of all in the development of sustainable cities (Narang and Reutersward, 2006; Ansell and Gash, 2007).

Working closely with governance and all other actors, collaborative urban planning has created pathways for equitable economic growth that operates within environmental constraints. Adequate strategies for sustainable open spaces delivery for example have been provided, based on planning and legal frameworks and equipped with hierarchical open space delivery instruments with inbuilt financing mechanisms like planning generated betterment values, trade-offs on more on-site open space for higher plot ratio, tax rebates for developers of free public parks and others (Dunnet et al., 2002; UN-Habitat, 2017). These have been of critical importance in the planning, development and management of public urban

open spaces (Norchian et al., 2015; WHO, 2010).

Literature shows that collaborative governance and planning are generally not in practice in Africa. In the continent, urban planning is negated by poor governance, which facilitates planning decisions by vested interests thus causing inappropriate developments that are not aligned to the zoning ordinances (Cobbinah et al., 2016). Nairobi City governance has been noted for high levels of informal development and employment, poor functioning land sector, massive sale of public land, ineffective urban planning institutions and unethical practices (World Bank, 2016; Guneralp et al., 2018). As a consequence, public open spaces have not only been threatened but actually alienated, privatized and developed into other urban land uses mainly for private gain (Makworo and Mireri, 2011; World Bank, 2016).

The Nairobi City planners provided 2,934 hectares of open spaces comprising 29% of the town area. Their design philosophy was to emphasize the need for consolidation and compactness of linking together the various open spaces and its careful distribution among the neighbourhoods (White et al., 1948). This was based on the early planning fathers' park system model strongly supported by Psycho-evolutionary Stress Reduction and the Environmental Sustainability Theories. Their design philosophy was based on top-down rational theory lacking in public participation. This has proved ineffective in tackling modern urban challenges and is increasingly giving way to Collaborative governance and urban planning in the global North cities (UN-Habitat, 2009; Narang and Reutersward, 2006).

In addition to the 1948 provision, governance in Kenya had made generous provision of public open spaces. Karura and Ngong forests were excised in 1932 and later gazetted (Green Belt Movement, 2009). In 1946 the 117km^2 Nairobi national park was established. This was to become the only global national park within a city boundary (Hyman, 2011; Patinkin, 2013). Other open spaces such as City Park, the Royal Golf Club, Arboretum and the Horse Race Course were in place by 1927 (Local Government Commission, 1927). The 1899 Nairobi, then called 'Nyrobi,' a Maasai name meaning the place of clean waters, was a tropical forest, teaming with biodiversity, including big and small wildlife (Hake, 1977).

Nairobi has not been provided with major freely accessible public open spaces since then. UN-Habitat (2016) noted an existing non-comprehensive open space typology composed of local, neighbourhood, citywide and linear open spaces in Nairobi and absence of legal and regulatory frameworks and open space provision standards for sustainable delivery and management of public open spaces.

RESEARCH METHODS

The current research was based in Nairobi as the capital city of Kenya and headquarters of many international organizations including UN-Habitat and United Nations Environment Programme (UNEP). Its theoretical framework was based on five interrelated theories, which displayed a complex interplay with the dependent variable of urban open spaces and independent variables of urban planning and governance. The theories acted as tools to help understand, predict and explain data for better articulation of the study findings (Zaidah, 2007).

The overarching Environmental Sustainability Theory instructs on the necessity of equal address of the three pillars of development (Basiago, 1999). Collaborative Planning and Governance Theories insist on the application of the principals of collaborative professional practice (Ansell and Gash, 2007). Psycho-evolutionary Stress Reduction Theory informs on the essential connection of man to nature for his health and wellbeing (Harting et al., 2014). The Theory of Common Property Resources highlights the greed for the commons, in this case public open spaces, and their consequent administrative difficulties (Hawkshaw et al., 2012; Anukwonke, 2015).

The study design utilized mixed philosophical worldviews. The positivist approach was preferred for neutrality through randomization while interpretive approach was used to study the complex and contextually transforming realities (Dammak, 2015). Population sampling was based on the Yamane scientific formula (n=400) from a target population of 4.2 million and administered through simple random sampling. The sampling

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frame was developed from four particularly significant sub-counties to the study (Westlands, Roysambu, Kamukunji, and Starehe) and was determined by the prevailing population in each sub-county.

The study was designed around a conceptual framework demonstrated by literature review as having strong correlations between collaborative urban planning and sustainable open space outcomes, heavily supported by collaborative governance (Narang and Reutersward, 2006; WHO, 2010). The applied research instruments were general and key respondent questionnaires, face-to-face interviews, participant observation and review of documents and maps. Data was collected simultaneously, analysed separately and triangulated and interpreted for results (Creswell, 2014). The study's unit of analysis was aggregate group scores displayed in percentages, tables, histograms, bar and pie charts. Loss of public open spaces was determined through use of Geographic Information Systems overlays of the 1948 public open spaces map (White et al., 1948) and the JICA Land Use Map (2005). Alienated public open spaces were regionally grouped as guided by the Nairobi City zoning map and valued using Cytonn's Real Estate (2018) land values.

RESULTS

Serious loss of public open spaces

The study revealed massive loss of public open spaces in Nairobi City as supported by Makwaro and Mireri (2011) and the Theory of Common Property Resources. The loss comprised of about 83% (2,444 hectares) of the 1948 provision (**Figure 2**) constituted of parks, wetlands and riparian reserves with an approximately value of Kenya shillings 1.6 trillion or 15.8 billion US dollars. About 2,203 hectares of public forests were also alienated. About 476 hectares of Karura Forest were excised and allocated to 67 companies though title deeds were later cancelled (Green Belt Movement, 2009). Friends of Karura Forest (2013) posited that about 100 hectares of Karura forest and 2000 hectares of Ngong Forest are still in private ownership (**Table 1**).

In recent years, about 12 hectares of Southern

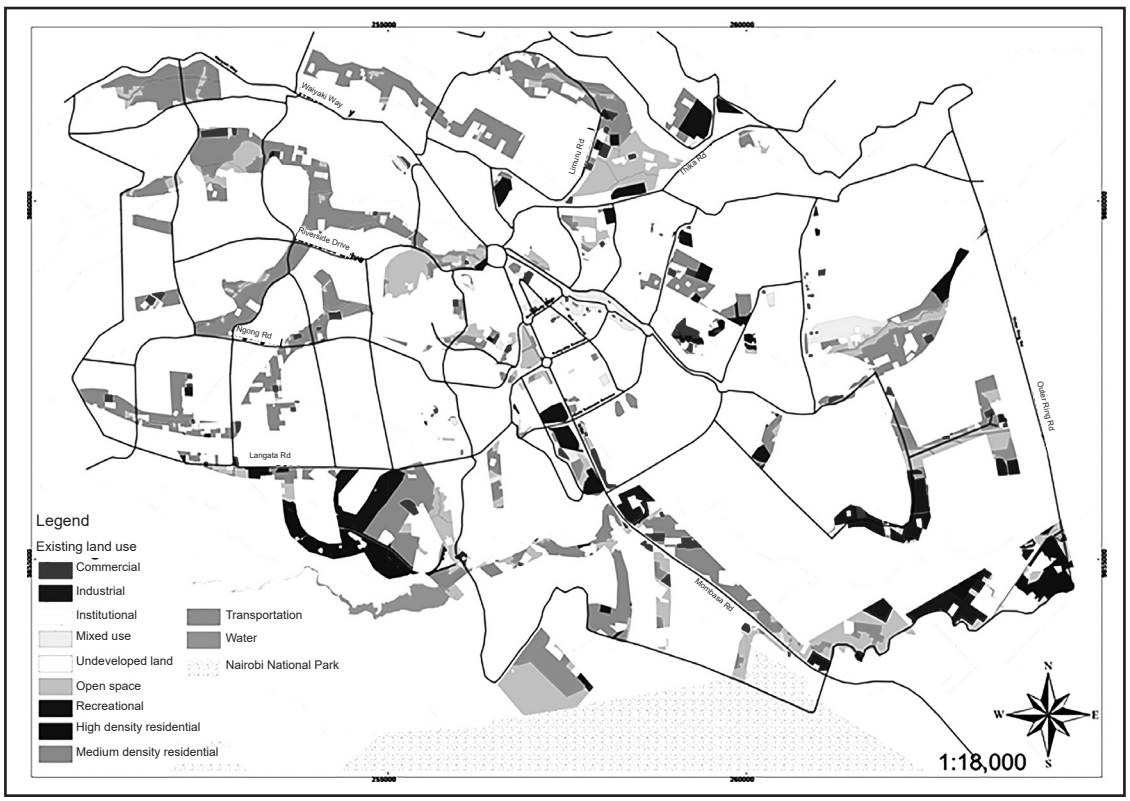

FIGURE 2
Nairobi open space alienation and the current land use
Source: Adapted from White et al. 1948 and JICA 2005, 2018

TABLE 1: Identifiable alienated open spaces in Nairobi

Open spaces in Ha	New land use	Lost open spaces in Ha.
1948 planned City-wide open spaces = 2934 including riparian reserves	Institutional	772
	Industrial	103
	Commercial	67.64
	Transportation	86
	Mixed use	90
	Medium density residential	898
	High density residential	121
	Recreational (private clubs)	141
	Allocated & undeveloped	165
Subtotal		**2,444**
Karura Forest	Residential, institutions and embassies	100
Ngong Forest	Residential, institutions, transportation	2,000
Arboretum	Residential and offices	103
Sub total		**2,203**
Grand total		**4,647 (11,483 acres)**

Source: Mwaniki et al. 2019

Bypass have been excised from Ngong Forest. A 9 hectares strip of land, 6 kilometres long and 15 metres wide, was reserved for the overhead Standard Gauge Railway in the Nairobi National Park whose support pillars occupy 0.3 hectares (Habitat Planners, 2016).

The study results showed that Nairobi City Rivers, encompassing Nairobi, Ngong and Mathare Rivers and their tributaries were highly neglected and abused. The abuse started from early 1900s when the pristine waters, for the first time, received raw sewage from the European residential estates located in the western part of the city (The Local Government Commission, 1927). About 97% of the survey respondents attested to the fact that Nairobi Rivers are smelly from raw sewage and chemicals and full of plastics and garbage (95%) as supported by Mbui et al. (2016) who stated that industrial and agricultural wastes are discharged direct into Nairobi Rivers.

The Nairobi public is aware of alienation of public open spaces

About 69% of the survey respondents knew that the open spaces currently provided in Nairobi County are not adequate while 84% attributed this to alienation. About 85% of key respondents confirmed non-availability of public parks in their residential neighbourhoods and all concurred (100%) that wetlands have been allocated. Alienation of wetlands was confirmed by 91% of the general survey respondents while 95% claimed governance apathy in protecting the resource from alienation. Repossession was recommended by 94% of the general respondents and 100% of key respondents with 72% of the general survey respondents opting for demolition of existing structures. Only 22% of the survey respondents would go to court for remedial action.

The respondents understand the importance of open spaces

The majority of the survey respondents were aware of the many benefits of open spaces and the consequences of their inadequate provision. In support of Psycho-evolutionary Stress Reduction Theory and the findings of Annerstedt et al. (2012) and Rakhshandehroo et al. (2015), 74% and 81% of the survey respondents connected

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open spaces deficiency to youth criminality and poor performance in schools respectively. Many of the survey respondents recognized that lack of urban open spaces results in poor mental (79%) and physical (91%) health. About 79% of those who had knowledge of benefits of open spaces were 39 years of age and under with 64% having secondary and post secondary education. Youth, with higher education, had a positive influence on the survey respondents' comprehension of the linkages between lack of open spaces, poor health and poor school performance (**Figure 3**).

Nairobi lacks participatory approaches in open spaces delivery

The survey respondents displayed willingness to participate in the planning (93%) and management (92%) of public open spaces, including tree planting (97%), tree nurturing (92%) and protecting open spaces from alienation (95%). Their good will notwithstanding, 86% of the survey respondents reported lack of participation in activities relating to public open spaces. Senior public urban planners, professionals and Government managers taking part in the current study were of the opinion that stakeholder participation in the delivery of open space results in the best plans (75%), the best managed parks (70%), the most effective policies (70%), the least crime cities (70%) and the most fulfilled residents (70%).

Nairobi lacks sustainability in public open spaces delivery systems

Nairobi City lacks institutional, planning and legal frameworks to provide delivery, management and protection instruments and facilitative environment for meaningful public participation and financial resources reported as most critical for sustainability in open spaces delivery (UN-Habitat, 2009; Jennings et al., 2016). Additional pointers to lack of sustainability in Nairobi City open space delivery are alienation and mismanagement of open spaces (**Figure 4**) and the consequent recreational disenfranchisement of 85% of Nairobi City residents.

Classify open spaces and establish provision standards

As noted by Nochian et al., (2015) it is difficult to sustainably deliver urban open spaces without a comprehensive typology and open space provision standards for each classification. The study has confirmed the findings of UN-Habitat (2016) on

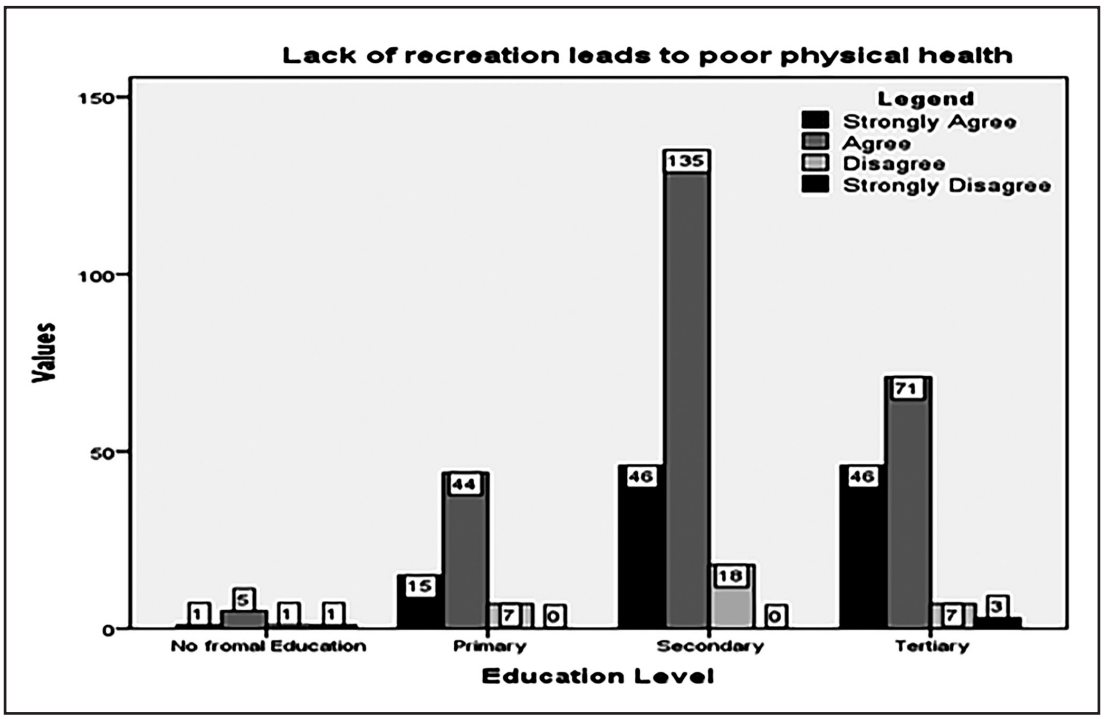

FIGURE 3
Level of education against knowledge of importance of open spaces
Source: Field survey 2018

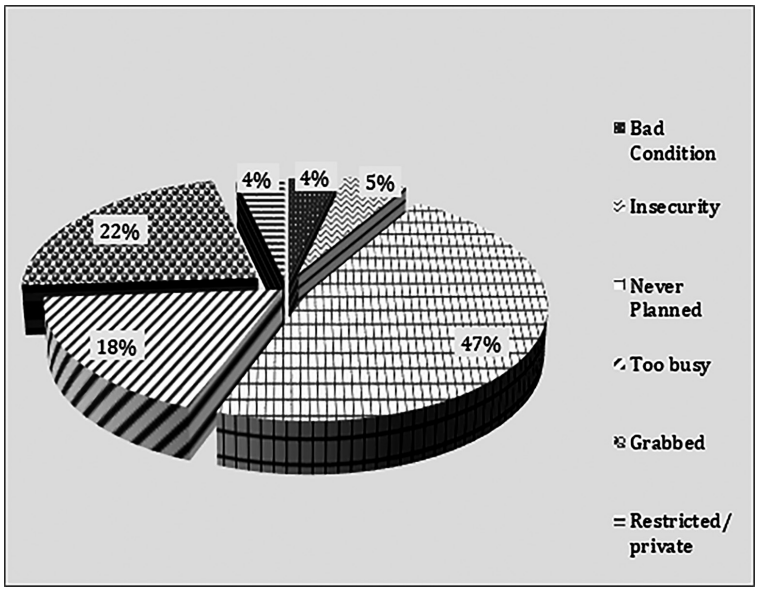

FIGURE 4
Reasons for not using public open spaces
Source: Field survey 2018

the absence of these important provision tools. The survey respondents strongly supported (92%) a combined provision standard of 2.4 hectares per 1000 population for local, neighbourhood and linear green parks such as riparian reserves delivered through reservation of open spaces for the consequent populations at development approval stage in accordance with Article 40(3) (b) of the constitution of Kenya (Government of Kenya, 2010).

District parks, urban parks, ecological and historical parks and forests should be provided through direct public purchase. About 60% of the survey respondents recommended provision of district and urban parks by the national government under the current governance structures as opposed to 31% who preferred this function to be carried out by the county.

Deliver sustainable public open spaces

The Nairobi City government manages 2,577 hectares (54%) of the total city public open spaces with free accessibility. The figure was derived from subtracting 321 hectares of government owned and managed stadiums, cultural and agricultural parks and 1,856 hectares of forests with restricted public access from the total area of public open spaces in Nairobi City (4,754 hectares) as reported by UN Habitat (2016). In 2018, the existing freely accessible open spaces constituted per capita provision of 5.8m^2 against WHO's (2010) recommended minimum standard of 9m^2. Nairobi's provision is expected to drop to 4.4m^2 per capita by 2025 if no more provision is made. By 2025, Nairobi's projected population will be 5,762,639 requiring minimum open space deliveries of 8,079 hectares in accordance with the proposed provision standards. The 2018 public open space requirement stood at 5,300 hectares inclusive of previous backlog. The current provision of 2,577 hectares left a serious deficit of 2,723 hectares.

Enhance status of public urban planning and provide development finances

The study findings revealed Nairobi City governance as not providing adequate resources for open spaces delivery and management according to 56% and 90% of the general and key study respondents respectively. UN-Habitat (2017) noted the expensive nature of urban growth, which requires infrastructure and services such as roads, sewerage and water mains, airports and railways, telecommunication networks, open spaces, schools, houses, commerce, industries, hospitals, and others, all spatially provided for through urban planning. In support of Cobbinah and Darkwah (2016) Nairobi City governance needs to provide enhanced status and capacity for public urban planning with adequate financial

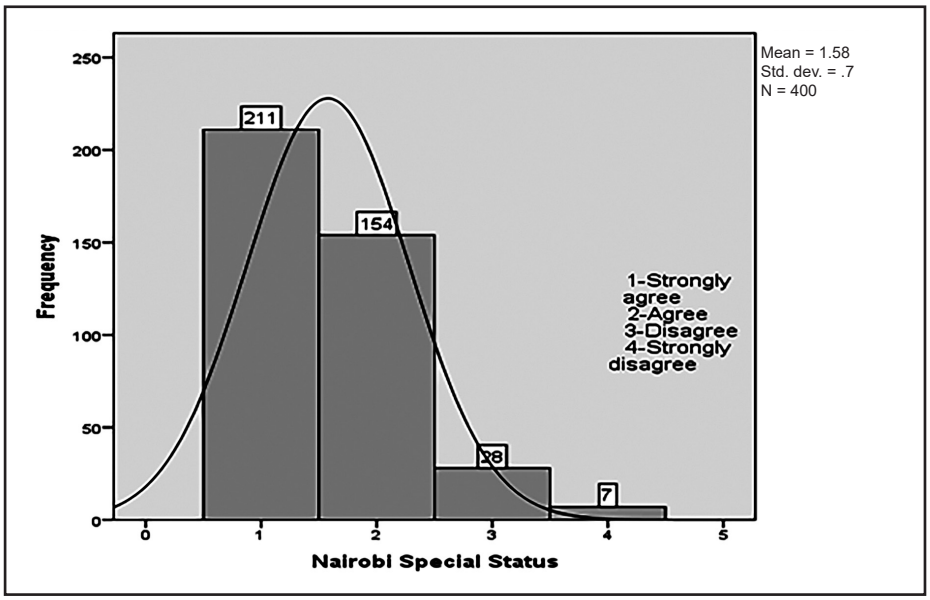

FIGURE 5
Elevation of Nairobi to Special Status District
Source: Mwaniki et al. 2019

resources for plan implementation.

Elevate Nairobi to a Special Status District

The study confirmed the findings of Ghimai (2011) and Ansell and Gash (2007) concerning the critical importance of collaborative urban governance in the delivery of sustainable growth including the provision of open spaces in line with Collaborative Governance Theory. Consequently 91% of the survey respondents overwhelmingly supported the creation of Nairobi County as a special status district (**Figure 5**) to green the city and unlock its potential for accelerated and innovative development.

DISCUSSION

The wanton abuse of public open spaces revealed by this study and supported by the findings of World Bank (2016) was possible because it was perpetrated from the highest offices in the land. For successful repossession of critical former public open spaces and demolition of existing structures overwhelmingly supported by the findings of this study, the same political process would need to be applied or its reverse in mass civic action. Any of these possibilities will effectively happen when the impacts of climate change from abused nature such as dwindling rivers, loss of biodiversity, hunger, diseases, fatalities and others become more widespread and thus better understood and appreciated. To forestall this, civic education in restoration and nurturing of the environment within collaborative urban planning and governance is urgently needed.

Repossession of the critical former open spaces and demolition of any structures on them may seem as extreme remedial measures involving huge investment losses. But riparian reserves and wetlands are un-transferrable and must be maintained where they naturally occur. Their loss and misuse through weak governance is permanent with serious impacts of floods, loss of life and property already experienced in Nairobi every heavy rainy season. The retention of wetlands and riparian reserves benefits the entire city ecosystem now and into the future replenishing underground water storage, increasing river volumes, controlling floods, cooling the city temperatures, saving life and enhancing agricultural production as reported by Cvejic et al. (2015) and Eisenman (2013). The city residents are aware that their continued stay in Nairobi without adequate public open spaces will ultimately cost them more dearly in loss of life and destruction of investments than repossession and demolition.

The study confirmed the findings of World Bank (2016) and UN-Habitat (2016) concerning the

state of open spaces delivery and management in Nairobi City and called for a serious review of urban planning practices and governance structures. The study findings showed the city residents as willing to participate in the delivery and management of public open spaces. Both management and professionals held the opinion that the involvement would be profitable. Poor governance is the primary stumbling block to sustainable and innovative city growth, health of ecosystems and people and sociocultural development.

Nairobi City requires complete overhaul of its governance structures to make room for selected and elected technocratic leaders within a Special Status District created and operated under an Act of Parliament that would grant the city greater freedom in its development agenda, income generation and expenditure. The innovative, facilitative and transparent governance operating under the rule of law would unlock the city's development potential, establishing Nairobi as an international and regional economic, transportation, cultural and innovation green hub through gainful engagement of all residents aided by collaborative action of all professions. Good professional practices would guide the city residents in taking environmental care of their big and little spaces. These include planting trees, avoiding littering, re-using and recycling waste, and creating infrastructure and incentives for walking, bicycling and public transport thus reducing the climate change footprint.

Collaborative city governance would institute open space delivery systems and equitable legal instruments to enhance the pool of both public and private open spaces. It would enhance public open spaces through judicious application of open spaces provision standards by developers, direct purchase of specially ecologically endowed spots or appropriately located areas and humanely repossess undeveloped and vital former open spaces.

In its transformative role, collaborative governance would create legal instruments to enhance open spaces within built areas. As an example, it would facilitate exchange of on-site ground open spaces for height in extra floors. It would help add additional economic value to dispensable former open spaces sold at current market values as opposed to their throw away initial acquisition prices. The new government would sell excess coverage in developments that have exceeded the permitted levels or to developers intending to exceed the permitted plot ratios. These would be sold for large sums of money that could purchase land for open spaces. As these developments have no open spaces for enjoyment by their consequent populations, compulsory purchase of vacant land within the neighbourhood at market prices would provide public spaces for active recreation and city greening to ameliorate climate change impacts they would otherwise continue to generate.

Special Status governance would make economic use of its land holdings for the common good. As an example the repossession of 3,500 hectares alienated from the 4,000 hectare Ruai sewerage treatment site (Nairobi City County, 2016) could partly accommodate 1,000 hectares of much needed forest in the eastern part of Nairobi. The forest would additionally ameliorate the treatment plant's bad odour that degrades its immediate area. Such governance would facilitate urban planning to make maximum use of riparian reserves in the eastern part of the city yielding about 1,846 hectares of public open spaces at varying widths of 150 meters on either side of the rivers. Direct purchase of land for forests, district and urban parks particularly in the same region would satisfy open space demand beyond 2025 at a constant $24m^2$ per capita.

The Theory of Common Property Resources has been perfectly played out in Nairobi. This study proposes assignment of ownership not to individuals but to developers, philanthropists, resident associations, companies and other stakeholders as the case may be with the national or county government. An anti-alienation legislation is urgently needed with dual title registration framework and mandates for every neighbourhood of the city, irrespective of land use, to officially register resident/owners associations, empowered to assist in the betterment and security of their environments. As power has been devolved to counties for better resource administration and management, so should the management of neighbourhood open spaces be taken down to local levels for better management,

and security against future alienation and criminal elements.

CONCLUSION

The objectives of the current study were to determine the loss of public open spaces in Nairobi City, to assess the knowledge of the residents on the importance of open spaces and to determine collaborative governance and planning approaches used in the delivery of public green open spaces. The data obtained from the study revealed high levels of knowledge on the benefits accrued from nurtured environments in the form of adequate provision of open spaces and awareness of alienation of the important public resource for private ownership. The study findings exposed serious deficiencies in collaborative governance and planning practices in open space delivery and management. The findings underscored the importance of transparent, facilitative and innovative governance that abides by the rule of law and involves stakeholders in finding solutions to all the challenges of development as exemplified by the current unsustainable state of public open spaces.

RECOMMENDATIONS

This study recommends transforming Nairobi City to a special status district, collaboratively governed through an Act of Parliament to ensure application of principles of good governance and facilitation of growth based on the three pillars of development. It also recommends that status of urban planning be elevated and to equip it to facilitate it to collaboratively deliver the planning mandate including provision of sustainable open spaces in Nairobi City. The final recommendation is to assign partial registered ownership of local and neighbourhood open spaces to pertinent stakeholders such as resident associations to forestall a repeat of the tragedy of the Nairobi commons.

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