

ADDRESSING URBAN CHALLENGES IN NAIROBI CITY, KENYA: THE SCOPE FOR COLLABORATIVE PLANNING APPROACHES IN ACHIEVING SUSTAINABLE DEVELOPMENT GOALS

MWANIKI BERNADETTE W.

Wangari Maathai Institute for Peace and Environmental Studies, University of Nairobi,
Kenya

GAKUYA DANIEL W.

Department of Clinical Studies, Faculty of Veterinary Medicine, University of Nairobi,
Kenya

MWAURA A. MUNYUA

Department of Urban and Regional Planning, School of the Built Environment, university of
Nairobi, Kenya

MUTHAMA NZIOKA J.

Wangari Maathai Institute for Peace and Environmental Studies, University of Nairobi,
Kenya

Available Online at: http://www.academicresearchinsight.com/udpaerj/3_2_1_17.pdf

CITATION: Mwaniki, B. W., Gakuya, D. W., Mwaura, A. M. & Muthama, N. J. (2019). Addressing urban challenges in Nairobi City, Kenya: The scope for collaborative planning approaches in achieving sustainable development goals. *Urban Development, Planning and Environmental Research Journal*, 3(2), 1-17

ABSTRACT

Urban planning is increasingly seen as having a critical role in confronting the unique and serious challenges of the 21st Century generated by man-made drivers that cause pressures on the environment creating life threatening impacts. Governments and scholars in the global North have formulated innovative and technologically based urban planning models and strategies that deliver greener, more efficient and sustainable growth generating cities. The study aimed to examine international urban planning models that deliver the most open spaces and the strategies used in the delivery process. It additionally examined the state and structures of urban planning in Kenya and Nairobi, endeavouring to explore what holds urban planning in Nairobi City from maximum service delivery and its potential role in environmental enhancement and protection alongside the sustainable development goals (SDGs) proposed to world governments by the United Nations. Data was collected through a general questionnaire survey (N=400) and key respondents questionnaire survey (N=20). Key

respondents interviews, participant observation and document reviews were used to acquire in-depth local knowledge of the issues under empirical investigation. The results point towards plausible recommendations for more organized open space planning, legal frameworks and operational tools accompanied by a deliberate and decisive paradigm shift towards new collaborative planning models that deliver more sustainable cities.

Key Words: *urban planning, urban challenges, planning models, sustainable development goals, open spaces, Nairobi City*

INTRODUCTION

The global urban population is growing fast. The 3% urban population in 1800 will be 6.9 billion (70%) in 2050 out of the total 9.9 billion (Population Reference Bureau, 2018). Africa's urban population will grow from the current 395 million to 2.6 billion by 2050 (Population Reference Bureau, 2017; Population Reference Bureau, 2018). Kenya's urban population will be 60 million by 2030 requiring an increase of towns over 100,000 population from 21 in 2011 to 37 in 2020 (Wolfgang, 2011). The constitutional devolution to 47 counties has assured slightly higher number of such towns. Kenya needs to start preparing for the next generation of towns and improving the existing ones in line with the SDGs.

Cities are the main generators of global warming, which is one of the greatest 21st Century challenges world governments are battling with (Henderson, et al., 2017) as it triggers extreme weather events that pose threats to life and biodiversity (Kabish, et al., 2016). World governments committed to reduce green house gasses to retain temperature caps at 2°C above the preindustrial level (United Nations. 2015). In 2016 Kenya's climate was warmer than the normal minimum and maximum averages of 17°C and 23°C respectively (Foeken and Mwangi, 1998) by 1.4°C (United Nations Commission for Africa. 2011). Nairobi temperatures have risen by 5.3°C to a high of 29.7°C from 1988 to 2015 (Oyugi Maurice Onyango, 2017). Climate change in Nairobi is higher than the 5°C worst-case scenario of Intergovernmental Panel on Climate Change (2014). This calls for urgent implementation of mitigation measures, specifically massive tree planting and reduction of CO₂ emissions in industries and transport sector (Byass, 2009; Kinney, et al., 2011).

Cities are essential for national growth. They occupy 3% of the global landmass and are highly effective commercial, industrial, innovation and social-cultural hubs (Daniel, 2016; Hoorweg, et al., 2011; Agunbiade, et al., 2016). National urban landmass of 20% produces 80% of the gross domestic product (UN-Habitat. 2017). Cities generate unique needs relating to infrastructure and services, recreation, energy, telecommunication, waste disposal and others. If not properly handled as happens in the global South cities, environmental degradation, depletion of natural resources, social disorganization and others occur with life threatening impacts like pollution, urban heat islands, global warming, climate change, loss of biodiversity and others (Serdeczny, et al., 2016; Mannucci and Massimo, 2017).

Researchers see collaborative urban planning as playing increasingly critical roles in assisting governments to deal with these unique challenges (UN-Habitat. 2009; Saynajoki et al., 2014)

and to optimize equitable distribution of scarce resources (Maruani, 2007). The World Health Organisation (2010) posited urban planning or its absence impacts on health and is of key importance in creating liveable cities of the 21st century.

Urban planning was founded almost simultaneously with public health to deal with the unhealthy living and working conditions in industrial towns of the late 18th century (Duhl and Sanchez, 1999). The profession was founded on rational theory's top down model (Csepely-Knorr, 2011). The American Planning Association defines urban planning as a profession whose mission is to improve the welfare and quality of life of the people under the planning influence for present and future generations (Carmon, 2013).

Collaborative urban planning is better equipped to deal with modern urban challenges due to its multi-disciplinary approaches and citizen participation (UN-Habitat. 2017). Wheeler (1996) considers collaborative planning as efficient in land management approaches especially protection of rich agricultural land from urban encroachment, greater use of public and non-motorized transportation, minimum waste and pollution generation, ecological restoration and cultural preservation. Maximization of income generation and its equitable distribution (UN-Habitat. 2016) and extensive greening for urban resilience (Tirla, et al., 2014) are other components of collaborative urban planning.

These collaborative planning strategies are operationalized through comprehensive planning and legal frameworks (Dunnet et al., 2002; UN-Habitat. 2017) that incorporate hierarchical planning instruments and land-based financing such as mechanisms to capture betterment values created by planning decisions, height trade offs for more onsite open spaces and calculated sale of building space beyond the approved heights. A legal framework to guide and enforce development laws, zoning ordinances and planning policies is of essence (Maryanti, et al., 2016; World Health Organisation, 2010).

Governments in the developed world have provided pertinent planning and legal frameworks and appropriately transformed urban planning through collaborative approaches (Maruani, 2007; Watson, 2009) and applied innovative city design models that deliver most green spaces so essential for health and climate change mitigation (Kaplan and Kaplan, 1989; UN-Habitat. 2017).

Some of the major urban greening design models include:

- a. The park system models pioneered by the early planning fathers based on zoning and developments set within interconnected parklands (Bohl, 2000; Wang *et al.*, 2013; Csepely-Knorr, 2011; Tempesta, 2015; Batley and Marshall, 2009).
- b. The radiant City by Le Corbusier comprising mixed-use skyscrapers designed within parklands later corrupted to the currently prevalent high-rise developments without open spaces (Bodger, 2012; Neal, 2010).
- c. The garden City by Ebenezer Howard consisting of satellite towns set on lush parkland (Maruani, 2007; Csepely-Knorr, 2011).

- d. Green Urbanism by Leyner Baham for sustainable, zero waste, renewable energy cities with high per capita open spaces (Nowark and Heisler, 2010; Lehmann, 2011; O'Connor, 2014; Haaland, *et al.*, 2015; Fischer *et al.*, 2018).
- e. The eco-City by Richard Register based on technological innovations, carbon freedom, renewable energy with strong emphasis on walking, cycling, public transit including nature-city balance (Sarkar, 2016; Ermolaeva, 2017).

The compact city is small and dense, carbon free with high connectivity but weak on open spaces (Neuman, 2005). The smart city is another modern urban design model with an emphasis on technology, smart infrastructure and entrepreneurship but is also deficient in open spaces provision (LeClear, 2002; Ahvenniemi, 2017).

Effective urban planning in Africa with a few exceptions like Rwanda (Habiyaambere, 2009; Daniel, 2016; Bafana, 2016) is negated by powerful vested interests that determine what and how planning decisions are made and implemented thus creating sustainability challenges (Cobbinah and Darkwah, 2016). Researchers note Nairobi's high rates of unemployment (60% of work force is in the informal sector), unregulated urbanization, urban sprawl, slums, poorly functioning land sector and ineffective planning institutions that are exacerbated by disputes over planning and land management functions. This causes jurisdictional ambiguities and delays in planning approvals and implementation with loss of investment opportunities that invalidates its growth engine potential (Leon, 2008; World Bank, 2016, Guneralp, *et al.*, 2018).

Kenya's planning, despite these challenges, is backed by the Constitution (Government of Kenya, 2010, articles 42 and 66 on environmental rights and land use planning powers), Kenya Vision 2030 (Government of 2009 on direction of Kenya's national development), National Land use policy (Government of Kenya, 2017 on long term urban and rural land use policies), National Spatial Plan 2015-2045 (Government of Kenya, 2016 outlining strategic development strategies and guidelines), National Spatial Plan (Government of Kenya, 2016, on short term development and strategic plans), The New Urban Agenda (Government of Kenya, 2017 on urban development guidance) among others. Legal and regulatory frameworks are based on Acts of Parliament such as the Physical Planning Act of 1996 (under review), Cities and Urban Areas Act 2017, Environmental Management and Coordination Act (Government of Kenya, 2012) Building Code (Government of Kenya, 2008) and the Physical Planning Handbook (Government of Kenya, 2008).

Nairobi City has a long history of urban planning dating back to the 1927 Nairobi Plan for Settler Capital (UN-Habitat. 2016) followed by the 1948 Master Plan For Colonial Capital (White, *et al.*, 1948), the 1973 Nairobi Metropolitan Growth Strategy (City Council of Nairobi, 1973) and Nairobi Integrated Urban Master Plan (JICA, 2014). Nairobi has a zoning policy (Nairobi City Council, undated) and many other planning policies. Nairobi Open Spaces Act (2017) is a litany of what to do or not to do in public parks while City Management Strategy (2018) notes the many forests in the city and their potential for harvesting timber, poles, medicinal plants and firewood. Guneralp, *et al.*, (2018) point to inadequate application of development control measures in Kenya.

The United Nations urges world governments to sustainably plan and build cities in order to grow their economies, defeat poverty and enhance intergenerational social and environmental equity (UN-Habitat. 2009; World Health Organisation, 2010; UN-Habitat. 2011; UN-Habitat. 2017). The world body almost pleads with them to play key roles in the planned growth of their towns and cities for better delivery of services (UN-Habitat, 2009) placing at their disposal strategies for better-planned cities (UN-Habitat, 2009; UN-Habitat, 2017), and clear targets within the Sustainable Development Goals especially SDG 11 (UN-Habitat. 2015). UN-Habitat in cooperation with Swedish International Development Agency has assisted Nairobi City in preparing an inventory of public open spaces (2016).

RESEARCH MATERIALS AND METHODS

The conceptual framework of the study (Figure 1) was based on collaborative planning theory. The theory contradicts rational planning with its top-down model resulting in management-planner-centric development. Collaborative theory advocates issues and people-centred planning where stakeholder consultations guide the planning process gaining on pertinent historical knowledge of the area including native wisdom for current and future generations (Jenkins, 2009; Hamman, 2017). This was supplemented by Psycho evolutionary stress reduction theory or stress reduction theory in short stresses the critical importance of urban open spaces in the wellbeing of urban residents (Ulrich, et al., 1991; Harting, et al., 2014). The study was conducted in Nairobi Kenya, as the capital City and headquarters of UN-Habitat and UNEP. It employed both qualitative and quantitative study designs for more accountable results (Williams, 2007). The qualitative approach was based on the case study method combined with documentary reviews, map interpretation, participant observations and interviews (Dammak, 2015). The quantitative approach was based on a scientifically sampled questionnaire survey (N=400). This was supplemented by key respondent questionnaire survey (N=20) that was purposively sampled. Survey data was analysed through SPSS

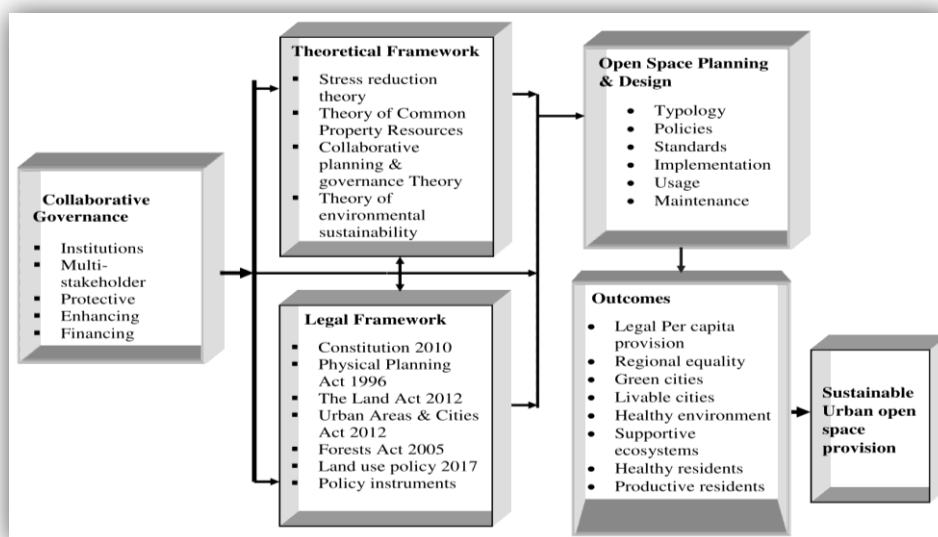


Figure 1: Research conceptual framework

RESEARCH RESULTS

Factors hindering urban planning in Nairobi

Kenya and Nairobi City have the requisite development plans, professional capacity and the technological hard and software to drive the nation to a second world green economy within living memory. The greatest hindrance is not inadequate resources but lack of good will to effect good urban governance, citizen participation and zero tolerance towards corruption as variously reported by the survey respondents many of whom perceived the city governance as corrupt in its dealings with its own residents (62%) and public land (84%). In support of Cobbinah and Darkwah's findings (2016) this study confirms the high politicization of urban planning in Nairobi. From participant observation and results of urban planning in Nairobi City, planners are mainly used to prepare part development plans for alienation of public land including open spaces and to recommend approval for developments irrespective of their merits at the high cost of professional credibility.

Expensive services that prohibit legitimization of development proposals

Public planning services are too expensive to be afforded by the average Nairobi residents. Key respondents and participant observation confirm the high charges for the service of planning approvals. The charges range from building plans at 0.5% of the proposed construction to lease extension fees of over one million Kenya shillings (US\$ 10,000) depending on the location and value of the property (at a charge of Kshs 30,000 per 0.1 hectares) to Kshs. 400,000 (US\$ 4,000) for review of master plans and Kshs.120,000 (US\$ 1,200) for change of land use applications among others. With such high charges for development permissions, many investors particularly in the lower income districts defer developments or go ahead without planning intervention notwithstanding the risk of demolition.

Loss of open spaces through densification without urban planning

The study confirms the findings of others (Zook, et al., 2012; Ahvenniemi, 2017) on environmental cost of densification without proper professional guidance. Documentary evidence shows that plots in the western region of the city were originally laid out on plots ranging between 0.3 to 0.4 hectares for single-family occupancy with ground coverage of 25% without sewer and 35% with sewer. On average 0.2 hectares were open spaces per property with dense mature tree cover. However, regional densities were selectively raised to a maximum of four storey developments. Guneralp, et al., (2018) findings on ineffective development controls measures conform to those of the current research as exemplified by construction of beacon to beacon skyscrapers in Nairobi City without commensurate policy changes or provision of small areas for children's play on the infrastructure laid for low density developments. For those already constructed, key respondents and participant observation note extensive tree felling, water shortage, traffic jams, overstretched leaking sewer and water mains among others.

The value of urban planning is not well appreciated

Republic of Kenya (2016) and key respondents confirmed the Kenya national planning functions are currently scattered across the ministry of transport, infrastructure, housing and urban Development which also manages the metropolitan department, the ministry of lands and physical planning, the ministry of devolution and planning assisting county governments, national land commission and the 47 counties though some of them operate without planners and planning departments. This study affirms World Bank findings (2016) on lack of urban planning systems and institutions as exemplified by absence of ministerial guardianship, scattering and duplication of planning functions. Professionally the planners are also scattered and operate from three non-collaborating institutions. Urban planning also lacks direction at the local level. In the Nairobi City County, urban planning has been reduced to research, development control, advertising, policy implementation and urban renewal (Figure 2). Key respondents and participant observation noted Nairobi City planners lack institutional capacity and operational tools. Without appropriate technology the planners are constrained in their service delivery. Urban planning currently enjoys minimal political support in the county. Governance stresses income collection from services rendered rather than income generation and employment creation through competitiveness and private investment.

Lack of open space planning and legal frameworks

None of the many official planning and legal documents reviewed addresses the environment in terms of its healing or replenishment for better performance. They instead speak of conservation while 122 hectares of open spaces and forests were on average lost annually for the last 30 years making a total of 4,647 hectares (Mwaniki, et al, 2019). The study confirms the findings of UN-Habitat. (2016) on lack of open space planning and legal frameworks for Nairobi. This study posits the same is also missing at the national level revealing the disenfranchisement of open spaces as a land use in Kenya and Nairobi City. Critical issues like per capita provision, design enhancement, creation of more forests, protection of open spaces against further encroachment, their enhanced performance and beauty are not being addressed both at national and local levels seriously hampering sustainability, the SDGs implementation and the war against climate change and pollution-related diseases and deaths (WHO, 2010; Mannucci and Massimo, 2017).

Neglect of the environment pillar

A clean and healthy environment is a constitutional right in Kenya. Rights come with responsibilities. The government and many citizens of Kenya have overlooked environmental nurturing. There is no official irrefutable stand on the essential significance of the environment to national development and peaceful coexistence of Kenyans or open spaces protection and repossession policies or land acquisition commitments going forward. Therefore, national and local development strategies essentially lack in meaningful environmental components. Kenya Vision 2030 has economic, social and political sectors as national growth pillars. The big Four Agenda is based on economic, health, housing and food

security pillars. Kenya therefore needs to align its development agenda on the global sustainable development goals that accord equal significance to the three pillars of development bed-rocked on good governance, which is a consequence of mature politics.

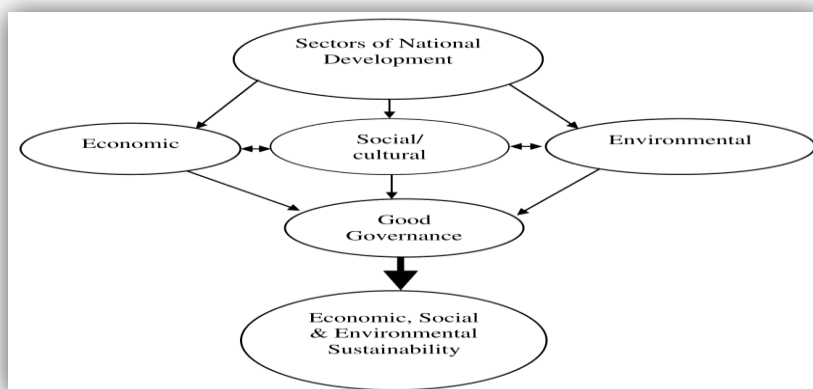


Figure 3: Sustainable development framework

Urban planning is non-responsive to residents' needs and aspirations

The study confirms the findings of Wheeler (1996) on the need of collaborative planning for responsive service delivery to a public that knows the serious impacts of deficient recreation. Big majorities of residents in Nairobi support the psycho evolutionary stress reduction theory in their knowledge of the essential significance of open spaces. Recreation is made possible by the provision of open spaces, which are positively related to good physical and mental health, prevention of criminality in youth and good performance of children in school. About 75% of the respondents reported lack of open spaces in their areas of residence as a result of poor urban planning. Consequently, the respondents requested provision of neighbourhood parks at 1.2 hectares (95%), district parks at 0.4 hectares (90%) and urban parks at 0.8 hectares (90%) per 1000 population. The recommended combined provision standard is 2.4 hectares per 1000 population or per capita of 24M2. The respondents expected reservation of 10% of land under development for open spaces (75% n= 400; 95% n=20) and use of tax money by the central government to purchase open spaces for public use (60%). Urban planning in Nairobi has also failed to plan for carbon free transport so highly recommended for sustainability (WHO, 2010; Cerin, et al., 2017). Only 1 person out of 420 respondents reported using a bicycle around the city while only 18% walk as a mode of transport exposing themselves to pollution and fatal accidents.

Urban planning in Nairobi City lacks in stakeholder participation

The study confirms the findings of World Bank, (2016) and Guneralp, et al., (2018) on lack of stakeholder participation due to lack of involvement by the Nairobi City planners and administrators. Non-availability of spaces for participatory planning is quoted by 75% of the respondents. About 83% and 88.5% of the respondents have respectively never participated in any form of open space planning in their own or other estates in Nairobi for this reason.

Poor delivery of open spaces and regional disparities are outcomes that are negated by collaborative planning and governance theories.

Summary of challenges in Nairobi in a DPSIR framework

Discussions with key respondents and participant observation amplified the main drivers of poor planning practices and the consequent pressures that cause the undesirable state in Nairobi (Figure 4). As reported by others (Duhl and Sanches, 1999; Wang, 2016) the impacts generated make the city hostile to life necessitating calculated application of mitigation measures through appropriate approaches to generate sustainability in the three pillars of development.

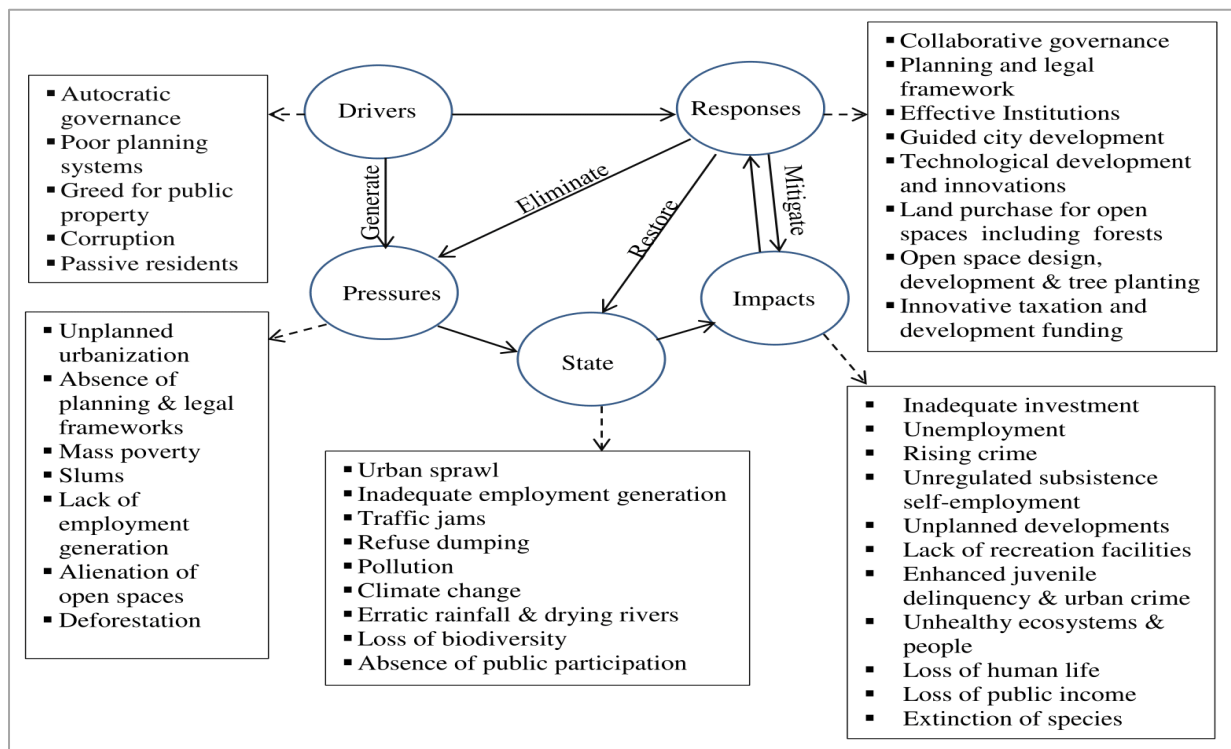


Figure 4: DPSIR model reflecting society-environment interactions in Nairobi

The restoration of destroyed state of the environment is essential to reverse the serious impacts noted in Figure 4. An example of one such state is lack of public participation in the planning process with serious multiple impacts that lead to environmental degradation like occupation of open spaces for slum dwelling or petty trading for subsistence self employment as confirmed by the World Bank (2016) thereby creating possibilities of poor health to self and others. The state would be mitigated by collaborative planning through which affordable serviced work areas are provided for higher incomes and improved areas of residence.

Nairobi City government may not deliver SDGs through the current planning structures

UN-Habitat (2009) has reiterated urban planning’s potential to deal with the 21st urban challenges. This study has demonstrated Nairobi City’s inability to deliver basic planning

services and the SDGs (especially SDG 11), indispensable to sustainability (Saynajoki, 2014), in its current state of governance. Under new beginnings key respondents and participant observation showed that functional urban planning under multidisciplinary approaches could effectively move the delivery of all SDGs and the Big Four Agenda with political good will and appropriate funding (Table 2).

Table 2: Urban planning strategies towards implementation of SDGs and Big4 Agenda

No	Goal	Application through urban & regional planning
1.	End poverty by 2030.	<ul style="list-style-type: none"> ➤ Plan linkage routes between cities and hinterlands for mutual trade ➤ Plan accessible urban markets for rural products ➤ Provide land for agro-industries ➤ Plan rural towns and provide land for training and betterment centres ➤ Provide land for industries and trading next to slums intended for incremental upgrading
2.	End hunger.	<ul style="list-style-type: none"> ➤ Plan land for urban agriculture ➤ Formulate policy to check subdivision of rural areas and land adjacent to cities and towns into uneconomic parcels. ➤ Protect and enhance sustainable urban animal husbandry through policy. ➤ Protect wetlands and provide land for urban fish and irrigation dams.
3.	Good Health and Well-being	<ul style="list-style-type: none"> ➤ Provide land and way leaves for urban waste management. ➤ Provide ample, equitable and hierarchical open spaces on per capita basis ➤ Create densities that support some on-site green space, infrastructure and services and contain urban sprawl. ➤ Offer affordable development guidance and control. ➤ Encourage tree planting by all Kenyans and resident non-Kenyans. ➤ Provide recreation facilities and encourage walking and cycling. ➤ Reduce car dependence through walking, cycling and well managed public transit to de-carbonate the city. ➤ Enhance man nature contacts and introduce safe animals in urban forests for enhanced biodiversity. ➤ Enhance ecological services for urban resilience. ➤ Optimize densities relative to open spaces, infrastructure and services.
4.	Quality Education	<ul style="list-style-type: none"> ➤ Create ample standards for institutions to create room for tree planting. ➤ Provide land for various recreational facilities and agriculture. ➤ Use planning strategies and standards that enhance health and security.
5.	Gender Equality	<ul style="list-style-type: none"> ➤ Design neighbourhoods with security of women and children in mind. ➤ Provide land for construction of gender suppressed homes and employment opportunities. ➤ Enhance stakeholder involvement in the planning and implementation processes. ➤ Provide land for construction of recreation and community centres where guidance on prevailing opportunities and counselling can be offered. ➤ Provide opportunities for self-betterment in education, training or trade. ➤ Bring health, education, work and services opportunities close to residential areas to avoid unnecessary travel. ➤ Engage in land use planning that nurtures innovative potential.
6.	Clean Water and	<ul style="list-style-type: none"> ➤ Conserve wetlands and create riparian reserves along rivers and plant appropriate trees, shrubs and grass.

Sanitation	<ul style="list-style-type: none"> ➤ Create room for linear open spaces within road reserves for tree planting to ensure aquifer replenishment, cooling and runoff control. ➤ Ensure high sewerage connectivity and provide drainage way leaves. ➤ Harvest storm water to urban dams and rainwater to high capacity tanks.
7. Affordable and Clean Energy	<ul style="list-style-type: none"> ➤ Reserve urban land for harvesting of clean energy such as wind and solar. ➤ Encourage walking, cycling and public transit through safe infrastructure and traffic separation. ➤ Encourage innovation through provision of secure technological incubators and inter-city competitions.
8. Decent Work and Economic Growth	<ul style="list-style-type: none"> ➤ Create space for development of quality infrastructure to attract investment. ➤ Provide land for public-private partnerships especially in housing, industries, infrastructure, services, telecommunications and innovations. ➤ Create investment climate and competitiveness through clear and transparent operational rules, publicised planning regulations and building code and offering incentives to companies with high, decent employment generation. ➤ Approve development plans without delay giving free appropriate technical advice where ever possible ➤ Reduce charges for development approvals to the minimum. ➤ Create land for incubation of first time and innovative companies and seek seed capital on soft loans for relocation at the appropriate time. ➤ Inculcated service and servant mantra to those in civil service and politics.
9. Industry, Innovation & Infrastructure	<ul style="list-style-type: none"> ➤ Provide serviced land for industries with buffers for health purposes. ➤ Ensure land for sewerage and way leaves is provided and encourage use of least polluting industrial technologies insisting on polluter pay principle. ➤ Transfer or innovate environment friendly infrastructure technologies. ➤ Ensure provision of adequate land for infrastructure and telecommunications. ➤ Plan for high technology innovation incubation centres.
10. Reduced Inequality	<ul style="list-style-type: none"> ➤ Ensure potential access to land for all. ➤ Create sustainable cities. ➤ Avail serviced land and do seed capital advocacy planning for self-employment. ➤ Plan for healthy affordable food outlets equitably distributed.
11. Inclusive, safe, resilient and sustainable cities and human settlements	<ul style="list-style-type: none"> ➤ Guard against urban sprawl. ➤ Insist on clean water and toilet provision in all unplanned settlements. ➤ Demystify urban planning and encourage owner home construction. ➤ Protect ecological and historical sites for current and future generations. ➤ Upgrade slums and other settlements through stakeholder involvement. ➤ Plan for safe and secure urban spaces providing open spaces and recreation facilities to minimize juvenile delinquency and bad health. ➤ Devolve local services like tree planting and beautification of areas of residence to residents through resident associations. ➤ Teach people their basic planning rights and responsibilities
12. Responsible Consumption and Production	<ul style="list-style-type: none"> ➤ Provide small plots for urban agriculture and cooperate with other professionals in demonstrating to people how to grow own vegetables. ➤ Provide land for modern community centres where lifestyle programmes can be run.

13. Climate Action	<ul style="list-style-type: none"> ➤ Provide land or infrastructure that can promote walking, cycling and public transit. ➤ Ensure anti-pollution measures are built into the industrial building plans. ➤ Provide land for open spaces and large dams to hold water runoff to facilitate underground percolation and urban off-season farming. ➤ Plant dense trees with wide canopies to protect against urban heat islands and to offer ecological services. ➤ Pedestrianize core city centre streets. ➤ Encourage architectural designs that conserve rain water, use clean energy and enhance natural day lighting.
14. Conserve and sustainably use marine resources	<ul style="list-style-type: none"> ➤ Conserve existing dams and water bodies and create urban new ones and populate them with fish. ➤ Clean rivers by creating green riparian reserves and legislate against all forms of pollution into blue areas. ➤ Provide space for adequate toilets in slum areas ensuring provision of riparian reserves legislating against use of rivers as toilet channels.
15. Protect, terrestrial ecosystems and protect biodiversity	<ul style="list-style-type: none"> ➤ Conserve or rehabilitate forests and plan for creation of new ones. ➤ Preserve unique ecosystems and areas of special beauty and urban rivers. ➤ Provide land for interconnected new urban forests leaving them in their natural states as much as possible for creation of biodiversity and ecosystem services. ➤ Plan for urban forests through wide road reserves and green belts. ➤ Plan for interconnection of open spaces for use as animal corridors. ➤ Manage forest resources through collaborative governance.
16. Promote inclusive societies and create accountable institutions.	<ul style="list-style-type: none"> ➤ Create community-life-enhancing residences by design and provide community facilities and open spaces. ➤ Equitably distribute land for all urban uses including infrastructure and services for current and future generations. ➤ Engage residents in collaborative urban planning and governance. ➤ Make public facilities accessible to all residents including the physically challenged.
17. Strengthen implementation and revitalize the global partnership.	<ul style="list-style-type: none"> ➤ Build SDGs targets into long-term strategic plans and short-term plans. ➤ Seek international carbon credit for new forests. ➤ Ensure the health of urban trees especially street trees. ➤ Review progress of target implementation annually. ➤ Measure the air quality levels constantly against domesticated international standards. ➤ Learn from international best practice studies.

DISCUSSION

The study has confirmed the findings of others (Avis, 2016; Buizer, et al., 2015) on the importance of governance to planning processes, institutions and funding. For better delivery of services, urban and regional planning need a home ministry or sector in City Hall for synergy, professional growth and competence, discipline and common purpose. Use of ICT and continuous training in better planning practices should be facilitated. Planners need to be ethical, resisting negative pressures that negate the principles of planning as generators of the balance between the three pillars of development.

The impacts of decimated open spaces and environmental destruction through alienation and densification, creating climate change in Nairobi City, and indeed Kenya as a whole, have been proven to be serious and costly challenges (Foeken and Mwangi, 1998; Oyugi Maurice Onyango, 2017). Progressive application of combined eco-city and smart city models within the 17 MDGs and the Big Four Agenda would move the city towards the sure road to sustainable growth in line with other world cities. Based on the survey results, such a critical development agenda would require special status in the Nairobi City governance, conferred by an act of parliament, supported by 91% of the respondents.

CONCLUSION

Nairobi is a beautiful city with unlimited potential for accelerated, sustainable and innovative growth driven by multidisciplinary approaches and equitable engagement of all residents. This study was conducted with the hope for new beginnings that this city, so well positioned and richly endowed, may exponentially grow to great heights. It is however imperative to acknowledge that Nairobi City has been for many years travelling in the 'wrong bus' (Maathai, 2009). The city urgently needs redirection by way of new governance and institutional structures that inject innovative impetus for growth within Kenya's international commitments on sustainable development.

REFERENCES

- Agunbiade, E. M. and Olajide, O. A. (2016). Urban Governance and Turning African Cities Around: Lagos Case Study. Partnership for African Social and Governance Research Working Paper No. 019, Nairobi, Kenya.
- Ahvenniemi, (2017). What are the differences between sustainable and smart cities? *Cities* 60, 234–245.
- Avis, W. R. (2016). Urban Governance (Topic Guide). Birmingham, UK: GSDRC, University of Birmingham. http://gsdrc.org/wp-content/uploads/2016/11/UrbanGov_GSDRC.pdf
- Batley and Marshall, (2009). The Evolution Of Cities: Geddes, Abercrombie And The New Physicalism, Centenary paper, TPR, 80 (6) 2009
- Bodger Emily, (2012). The Evolution of Urban Planning in 10 Diagrams,
- Bohl Charles, (2000). New Urbanism and the City: Potential Applications and Implications for Distressed Inner-City Neighbourhoods, Housing Policy Debate, Volume 11, Issue 4761.
- Buizer Marleen, Elands Birgit, Mattijssen Thomas, Van der Jagt Alexander, Ambrose Bianca, Geróházi Éva, Santos Artur, Møller Maja Steen, (2015). The Governance Of Urban Green Spaces In Selected Eu-Cities, FP7 project GREEN SURGE (ENV.2013.6.2-5-603567; 2013-2017), greensurge.eu.
- Busani Bafana, (2016). Africa's Cities of the Future <https://www.un.org/africarenewal/magazine/april-2016/africa%E2%80%99s-cities-future>

- Cerin Ester, Andrea Nathan, Jelle van Cauwenberg, David W. Barnett and Anthony Barnett (2017). The Neighbourhood Physical Environment And Active Travel In Older Adults: A Systematic Review And Meta-Analysis, *International Journal of Behavioural Nutrition and Physical Activity*, 14:15
- City Council of Nairobi, (1973). Nairobi Metropolitan Growth Strategy, Volume 1 and 2, Typography Printers LTD., NCM House, Tom Mboya Street, Nairobi
- Cobbinah and Darkwah, (2016). Urban planning and politics in Ghana, *Geo-journal* 82(6)
- Csepely-Knorr, (2011). The Birth of the Theory of Urban Green Systems in Britain and Hungary. Correspondence between Thomas H. Mawson and Béla Rerrich Concerning Urban Design Principles, *Acta Universitatis Sapientiae Agriculture and Environment*, Vol. 3 pp. 37-49.
- Dammak Abderrazak, (2015). Research Paradigms, Methodologies and Compatible Methods, *VERITAS*, Vol. 6, No. 2.
- Daniel Kristie, (2016). Public Open Spaces, A Key To Achieve Sustainable Development Goals, <https://ncdalliance.org/.../public-spaces-a-key-tool-to-achieve-the-sustainable-develop>
- Duhl L. J, Sanchez A. K., (1999). Healthy Cities And The City Planning Process: A Background Document On Links Between Health And Urban Planning, WHO <https://apps.who.int/iris/handle/10665/108252>
- Dunnett, N., Swanwick, C., & Wooley, H. (2002). Improving urban parks, play areas and green spaces. London, United Kingdom: Department for Transport, Local Government and the Regions, Publiekeruimte.info/Data/Documents/e842aqrm/53/Improving-Urban-Parks.pdf
- Ermolaeva Polina, (2017). In The Labyrinths Of The «Sustainable City» Concepts: The Meta-Analysis Of Contemporary Studies, *The Turkish Online Journal of Design, Art and Communication TOJDAC*, DOI NO: 10.7456/1070DSE/104.
- Foeken and Mwangi, (1998); Culture, Resources and Development in the East Africa littoral. Hamburg, Lit Verlag, 2000, pp. 85-100.
- Government of Kenya, (2008). The Physical Planning Handbook, Ministry of Lands, Housing and Urban Development, Government Printers, Nairobi
- Government of Kenya, (2019). National Land Use Act, Government Printers, Nairobi
- Government of Kenya, (2017). Sessional Paper No. 1 on National Land Use Policy, Government Printers, Nairobi
- Government of Kenya, (2016). National Spatial Plan, Government Printers, Nairobi
- Government of Kenya, (2019), Urban Areas and Cities Act, Government Printers, Nairobi.
- Government of Kenya, (2017). Kenya's Popular Version of The New Urban Agenda Towards Inclusive, Safe, Resilient and Sustainable Cities and Human Settlements, Ministry of Transport, Infrastructure, Housing and Urban Development. Kara.or.ke.
- Government of Kenya, (2010). The Kenya Constitution, Government Printers, Nairobi
- Government of Kenya, (2009). The Building Code, Government Printers, Nairobi
- Government of Kenya, (2012). Environment Management and Coordination Act, Government Printers, Nairobi

- GuneralpBurak, LwasaShuaib, Masundire Hillary, Parnell Susan and Seto Karen C, (2018); Urbanization in Africa: challenges and opportunities for conservation, *Environmental Research Letters*, 13, 015002.
- Haaland Christine, (2015). Challenges and strategies for urban green-space planning in cities undergoing densification: A review, *Urban Forestry & Urban Greening* 14 (2015) 760–77.
- HabiyambereThadée, Mahundaza Justice, MpambaraAimée, Mulisa Alex, (2009). Rwanda State of the Environment and Outlook Report, www.rema.gov.rw/soe/prelims.php
- Hamman Phillipe, (2017). [Definitions and Redefinitions of Urban Sustainability: A Bibliometric Approach, Les espaces verts urbains : éclairages sur les services écosystémiques culturels](#), Volume 11.
- Hartig Terry, Mitchel, Sjerp de Vries Richard, Frumkin Howard, (2014). Nature and Health, *Annual Review of Public Health*, Vol. 35:207-228.
- Henderson Rebecca M., (2017). Climate Change in 2017: Implications for Business, www.hbs.edu/environment/Documents/Climate_Change_2017.pdf, accessed on 21st August 2018.
- Jenkins, 2009: What It Takes to Be an Instructional Leader https://www.researchgate.net/publication/234594862_What_It_Takes_to_Be_an_Instructional_Leader
- Kinney Patrick L. , Gichuru Michael Gatari, Volavka-Close Nicole , Nicole Ngo Nicole, Ndiba Peter K., Law Anne, Gachanja Antony, Gaita Samuel Mwaniki, Chillrud, Steven N., and Sclar Elliot (2011). Traffic Impacts on PM_{2.5} Air Quality in Nairobi, Kenya, *Environ Sci Policy*, 14(4): 369–378.
- Lehmann Steffen, (2011). What Is Green Urbanism? Holistic Principles To Transform Cities To Sustainability, https://www.researchgate.net/.../221915598_What_is_Green_Urbanism_Holistic_Princip...
- Le Clear, E., (2002). Conservation Development And Smart Growth: A Development Technique For Open Space Protection, *Cornell Real, Estate Review*, 1, 23-35.
- Leon David A, (2008). Cities, urbanization and health, *International Journal of Epidemiology*, Volume 37, Issue 1, 1 February 2008, Pages 4-8,
- MathaaiWangari, (2009). The Challenge for Africa, Arrow Books Publishers, The Random House Group Limited, 20 Vauxhall Bridge Road, London,
- Mannuccio Mannucci Pier and Massimo Franchini, (2017); (Review) Health Effects of Ambient Air Pollution in Developing Countries, *International Journal of Environmental Research and Public Health*, 14, 1048.
- Maruani Tseira, Amit-Cohen Irit, (2007). Open Space Planning Models: A Review Of Approaches And Methods, *Landscape and Urban Planning* 81 (2007) 1–13.
- Maryanti M. R., H. Khadijah, A. Muhammad Uzair & M. A. R. Megat Mohd Ghazali, (2016); The Urban Green Space Provision Using The Standards Approach, *Issues And Challenges Of Its Implementation In Malaysia*, *WIT Transactions on Ecology and The Environment*, Vol. 210.
- Mwaniki Bernadette Wanjiru, Gakuya Daniel Waweru, Mwaura Arthur Munyua, Muthama Nzioka J, (2019). Divergent Perceptions In Open Spaces Provision In Nairobi:

- Towards New Beginning In Collaborative Approaches, International Academic Journal of Information Sciences and Project Management, Vol. 3, Issue 3, pp. 59-72
- Nairobi City County, (2017). Nairobi County Integrated Development Plan 2018-2022, [http://www.kpda.or.ke/documents/CIDP/Nairobi%20County%20Integrated%20Development%20Plan%20\(CIDP\)%202018-2022.pdf](http://www.kpda.or.ke/documents/CIDP/Nairobi%20County%20Integrated%20Development%20Plan%20(CIDP)%202018-2022.pdf)
- Nairobi City Council (undated). A Guide of Nairobi City Development Ordinances and Zones, www.ccn-ecp.or.ke/asset_uplds/files/zoneguide.pdf
- Nallathiga Ramakrishna, (2007); Compact City and Smart Growth as Policy guiding models for achieving Sustainable City Development: The case for Mumbai metropolis, ICFAI Journal of Urban Policy II(1): 42-59.
- Neuman Michael, (2005). The Compact City Fallacy, Journal of Planning Education and Research 25:11-26
- Nowark David J. and Heisler Gordon M., (2010); Air quality effects of urban trees and parks, national recreation and parks association, www.nrpa.org, accessed on 26-02-18
- Ongoma Victor, Nzioka J. Muthama, and John K. Ng'ang'a, (2010); Effects of Urbanization on Climate of Nairobi City, Journal of Meteorology and Related Sciences, 4, 49 –60.
- Oyugi Maurice Onyango, (2017). Modeling the Effect of Land Use and Land Cover Variations on the Surface Temperature Values of Nairobi City, Kenya, Resources and Environment 2017, 7(6): 145-159 Pages 239-252 | Published online: 16 Dec 201, Journal of the American Planning Association, Volume 80, 2014 - Issue 3
- Peter Byass, 2011: Climate change and population health in Africa: Where are the scientists? https://www.researchgate.net/publication/40851237_Climate_change_and_population_health_in_Africa_Where_are_the_scientists
- Population Reference Bureau, Human Population: Urbanization <http://www.prb.org/Publications/LessonPlans/HumanPopulation/Urbanization.aspx> downloaded 18-01-18.
- Population Reference Bureau, (2018); World Population Data Sheet with focus on Changing Age Structure, <https://www.prb.org/2018-world-population-data-sheet-with-focus-on-changing-age-s>
- Project on Integrated. Urban Development Master Plan for the City of Nairobi, JICA (2014). <https://www.jica.go.jp/english/news/field/2015/c8h0vm0000966zqy-att/c8h0vm0000966zvu.pdf>
- Robert Fischer (2018): Energy Supply Potentials in the Northern Counties of Finland, Norway and Sweden towards Sustainable Nordic Electricity and Heating Sectors: A Review <https://www.mdpi.com/1996-1073/11/4/751>
- Sarkar A. N., (2016). Eco-Innovations In Designing Ecocity, Ecotown And Aerotropolis, Journal Of Architectural Engineering, Tech 5: 161.doi:10.4172/2168-9717.1000161

- Säynäjoki, E. S., Inkeri, V., Heinonen, J., & Junnila, S. (2014). How central business district developments facilitate environmental sustainability: A multiple case study in Finland. *Cities*, 41(A), 101-113. <https://doi.org/10.1016/j.cities.2014.05.010>
- Serdeczny Olivia, *et al.*, (2016). Non-Economic Loss and Damage in the Context of Climate Change: Understanding the challenges
https://www.die-gdi.de/uploads/media/DP_3.2016.pdf
- Sternberg, R. J, (1993). *The Psychologist's companion* (3rd edition) Cambridge: Cambridge University Press.
- Tempesta, Tiziano., (2015). Benefits and costs of urban parks: a review, *AESTIMUM* 67, 127-143
- Tirla Maria-Laura, (2014). Green Cities – Urban Planning Models Of The Future, <https://www.researchgate.net/publication/271587798>
- Ulrich Roger S., (1991). Stress Recovery During Exposure To Natural And Urban Environments, *Journal of Environmental Psychology*, 11, 201-230.
- UN-Habitat, (2017). Action Framework for Implementation of the New Urban Agenda, <http://nua.unhabitat.org/AFINUA19thApr.pdf>
- UN-Habitat, (2009). The Role Of ICT In The Proposed Urban Sustainable Development Goals And The New Urban Agenda
<https://www.ericsson.com/assets/local/.../the-role-of-ict-in-the-new-urban-agenda.pdf>
- UN-Habitat; (2009). Planning Sustainable Cities,
mirror.unhabitat.org/pmss/getElectronicVersion.aspx?nr=2831&alt=1
- UN-Habitat, (2016). Nairobi Citywide Open Space Inventory and Assessment, unhabitat.org
- United Nations, (2015). Transforming our World: the 2030 Agenda for Sustainable Development,
<https://sustainabledevelopment.un.org/post2015/transformingourworld>
- United Nations Economic Commission for Africa, (2011). Climate Change And Health Across Africa: Issues And Options. <http://www.uneca.org/acpc/publications>
- United Nations Population Fund, (2016). Urbanization,
<http://www.unfpa.org/urbanization>, downloaded 18-01-18
- Watson Vanessa, (2009). The Planned City Sweeps the Poor Away: Urban Planning and 21st Century Urbanisation, *Progress in Planning*, 72, 151-193.
- Williams Carrie, (2007). Research Methods, *Grand Canyon University Journal of Business & Economic Research*, Volume 5, Number 3
- Wolfgang Fengler (2011) Why do Kenyans want to live in cities?
<http://blogs.worldbank.org/africacan/why-do-kenyans-want-to-live-in-cities>
- World Bank, (2016). Republic of Kenya, Kenya Urbanization Review, Documents. worldbank.org/.../AUS8099-WP-P148360-PUBLIC-KE-Urbanization-AC...
- World Health Organization,(2010). Urban Planning, Environment and Health, From Evidence to Policy Action, www.euro.who.int
- Z Neal, (2010) Refining the air traffic approach to city networks : *Urban Studies* 47 (10), 2195-2215
- Zook Julie Brand, (2012).Design and Pedestrianism in a Smart Growth Development, *Environment and Behaviour* 44(2) 216–2