Smart And Sustainable City Index for Nairobi City

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Introduction

The Smart and Sustainable Cities Index (SSCI) in Kenya is a comprehensive framework to measure the status of smartness and sustainability across the Kenyan cities. The pursuit of smart and sustainable urban development has become an imperative for cities globally. The concept of smart and sustainable cities underscores the need to leverage on technology for innovative urban environments that enhance the quality of life for residents. The overarching goal of smart and sustainable cities is to strike a harmonious and efficient balance between economic development, social well-being, and ecological preservation. In this policy brief, we present the score card of Nairobi City, a significant urban centre in Kenya.

This policy brief explores the specific indicators and performance measures relevant to Nairobi City, allowing stakeholders to pinpoint areas for improvement, prioritize policy actions, and collectively work towards a smarter and more sustainable urban future.

Nairobi Urbanization Journey and Characteristics

- Established in 1899 as a railway depot
- Declared a city on 31st October 1954
- City population: 4,395,749 (KPHC, 2019)
- City county size: 696.3 km²

SSCI Overview

The Smart and Sustainable Cities Index is measured using 7 pillars namely: smart people, smart living, smart economy, smart environment, smart mobility, smart infrastructure, and smart governance. The scores range from 0 to 1 with 0 as the worst and 1 as the best/frontier. Nairobi city county has an overall SSCI score of 0.71. The city has high scores on Smart people (0.97), Smart environment (0.88), Smart infrastructure (0.77), and Smart economy (0.74) pillars. The city scored above average on Smart Mobility (0.61) and Smart living (0.57) pillars. The city exhibited a relatively low performance on Smart Governance (0.42) pillar (Figure 1).

Figure 1: Nairobi City's overall SSCI and pillar performance
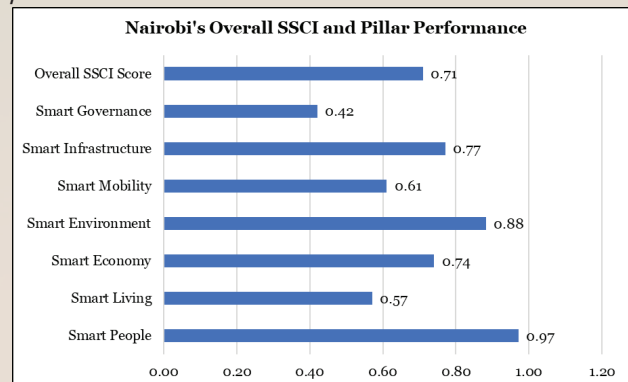
Smart People Pillar

Smart people refers to individuals who actively engage with technology, data, and innovative ideas to contribute to the development and betterment of urban living through sustainable practices and improved urban infrastructure. This pillar was measured using three indicators: education level, access to digital devices, and dependency ratio. Nairobi scored impressively well in this pillar with a mean score of 0.97. The specific score for each indicator is listed below:

- Education: 0.92
- Digital Devices: 0.99
- Dependency Ratio: 1.00

Areas of Concern

- Challenges in achieving universal access to education

Policy Recommendations

i) The County Government through the Early Childhood Development (ECD) and Vocational Training sub-sector to ensure efficient use of resources allocated to education for the city to attain education for all.

Smart Living Pillar

Smart living refers to the integrated measures to enhance convenience, efficiency, and comfort in daily

life. The pillar has these indicators: life expectancy, health insurance coverage, births attended by skilled health personnel, housing quality, and crime rate. Nairobi had a slightly above average score of 0.57 in this pillar. The indicators scores are as follows:

- Life expectancy: 0.68
- Health Insurance Coverage: 0.46
- Births attended by skilled health personnel: 0.99
- Housing quality: 0.91
- Crime rate: 0.39

Areas of Concern

- Low health insurance coverage
- Significant amount of criminal activity

Policy Recommendations

i) County government through the Health Wellness and Nutrition Sector to enhance accessibility of health insurance coverage to enhance access to health services.

ii) Fast-track the full operationalization of the Urban Areas and Cities Act, 2019 for the City Council to establish a coordination framework for implementation of National and County government security initiatives.

Smart Economy Pillar

Smart economy refers to the use of modern and efficient system where various sectors and processes are seamlessly interconnected to enhance productivity, resource utilization, and overall well-being. The pillar has the following indicators: GCP per capita, employment rate, ease of doing business, tech hubs, own source revenue gap and e-commerce. Nairobi city had an average score of 0.74. The score for each indicator is as shown below:

- GCP per capita: 1.00
- Employment rate: 1.00
- Ease of doing business: 0.37
- Tech hubs: 1.00
- Own Source Revenue: 1.00
- E-commerce: 0.07

Areas of Concern

- Under development of e-commerce sector
- Significant barriers to entrepreneurs when trying to establish or run businesses

Policy Recommendations

i) The County Government to consider simplifying and digitizing business registration, licensing, and permit processes to significantly improve the ease of doing business and attract more investors.

ii) The National and County Government to fast-track the implementation of a National Addressing Framework to enhance the uptake and growth of e-commerce.

Smart Environment Pillar

Smart environment refers to the use of technology and data to monitor, manage and optimize urban ecosystems for enhanced sustainability, resource efficiency and quality of life. The indicators used to measure this pillar are forest cover, waste management, access to improved water, access to improved sanitation, access to clean cooking energy and access to clean energy for lighting. Nairobi city county did quite well in this pillar with a mean of 0.88. The indicator specific score is as follows:

- Forest cover: 0.78
- Waste management: 0.80
- Access to improved water: 0.99
- Access to improved sanitation: 0.94
- Access to clean energy for cooking: 0.82
- Access to clean energy for lighting: 0.97

Areas of Concern

- Use of dirty and non-renewable energies
- Poor drainage and sanitation
- Environmental degradation

Policy Recommendations

i) The County Government in collaboration with Ministry of Energy and Petroleum to focus on incentivizing and adopting renewable energy sources to reduce reliance on fossil fuels.

ii) The Green Nairobi Sector Environment Sub-sector to prioritize and implement waste reduction and recycling programmes, alongside green building practices, to minimize environmental impact and promote a healthier urban environment.

Smart Mobility Pillar

Smart mobility refers to approaches adopted to ensure connectivity and automation to improve the effectiveness, safety, and accessibility of transportation systems. The pillar has the following indicators: miles to bike path, cars per capita and electric vehicles charging stations. Nairobi's average score is 0.61. The score for each indicator is listed below:

- Miles to Bike: 0.72
- Cars per capita: 0.11
- EV charging station: 1.00

Areas of Concern

- High car ownership per capita
- Non-motorized accessibility limitations

Policy Recommendations

i) The County Mobility and Works Sector in collaboration with Ministry of Roads and Transport to prioritize investments in cycling infrastructure and promote efficient public transportation.

ii) The Ministry of Roads and Transport need to consider enacting policies that reduce car dependence, enhance connectivity, and

support eco-friendly modes of transportation to create vibrant, accessible, and environmentally conscious urban environments.

Smart Infrastructure

Smart infrastructure refers to the integration of advanced technologies and digital solutions into physical systems such as buildings, transportation networks, and utilities to enhance their efficiency, sustainability, and functionality. The pillar has the following indicators: Computer and laptop ownership, Access to electricity, Households with mobile broadband, Mobile money subscription, Use of Internet, and Smartphone ownership. The average score for this indicator is 0.77. The specific score for each indicator is:

- Computer/laptop ownership: 1.00
- Access to electricity: 0.97
- Household with mobile broadband: 0.63
- Mobile Money Subscription: 0.94
- Use of internet: 0.52
- Smartphone ownership: 0.57

Areas of Concern

- Low access to Internet by households
- Low ownership of smart phones by households

Policy Recommendations

i) The County Government in conjunction with the Ministry of Information, Communication and Digital Economy to streamline regulations and permit processes to encourage private sector investments in expanding and upgrading mobile broadband (4G and 5G deployment) infrastructure in the city.

ii) The County Government in collaboration with the Ministry of Information, Communication and Digital Economy to offer incentives to mobile network operators to offer affordable data plans for the city's population.

iii) The Country Government to assist in acquiring low-cost smart phones being assembled at the Konza Technopolis for low-income households.

Smart Governance

Smart governance refers to the use of technology and other integrated approaches to efficiently improve and manage public services and decision-making processes within a society. Nairobi scored below average in this pillar with a mean score of 0.42. This pillar was measured using the following indicators: Voter turnout, Women representation in the County Assembly and Budget transparency. The score for each indicator is listed below:

- Voters' turnout: 0.56
- Women representation in the County Assembly: 0.14
- Budget transparency: 0.56

Areas of Concern

- Low proportion of women in the County Assembly
- Voter turnout constraints
- Significant budget transparency barriers

Policy Recommendations

i) The County Governments to strengthen smart governance by leveraging data analytics for evidence-based decision-making.

ii) The Independent Electoral and Boundaries Commission to adopt e-voting to enhance voters' turnout.

iii) The County Government together with the City Council and citizen fora to establish data-sharing platforms that promote transparency, engage citizens, and support policy formulation and monitoring.

iv) The County Government to acknowledge the critical role of women's representation in city governance and decision-making to comply with the two-third gender rule highlighted in the Constitution of Kenya, 2010. Furthermore, implement and enforce gender-inclusive policies that ensure equitable participation and representation of women at all levels of city management.

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