SUSTAINABILITY OF KONZA TECHNOPOLIS USING THE ESG MODEL

QUARTER 2 RESEARCH PAPER

Corporate, Research, Policy and Strategy

Table of Contents

1 Introduction

According to a 2022 PwC research institutional investment with an emphasis on ESG is predicted to rise by 84% to $33.9 trillion by 2026.[1] The United Nations estimates that by 2050, 66% of the world's population will reside in urban areas (United Nations, 2015a). This will present several challenges, including those related to air pollution, congestion, waste management, and human health (OECD, 2012). Given that the United Nations (2016) and the European Union (European Commission, 2014) have set ambitious targets for energy and climate change in the coming years, intelligent solutions must be developed to address the problems associated with urbanization. In the fight against climate change, cities play an important role, and the introduction of new intelligent technologies is viewed as a critical component in reducing greenhouse gas emissions and enhancing urban energy efficiency.

1.1 Purpose of the paper

The paper outlines the efforts of Konza Technopolis Development Authority in establishing a smart sustainable green city using the ESG model. ESG impact analysis and monitoring is essential for the Authority to integrate sustainable business strategies, mitigate risks, comply with regulations, build stakeholder trust, and contribute positively to society and the environment.

1.2 Smart Green Cities

Konza Technopolis Development launched its first ESG report in the Financial year 2022/ 2023. The report highlighted efforts that the Authority has put in place to ensure the sustainability of Konza Technopolis. Konza Technopolis is envisioned as a smart Green city(SGC). This paper presents the concept of a smart green city (SGC), which is a sustainable balance between technology means and environmental impact. SGC integrates smart city and green city concepts through the environmental, social, and governance (ESG) framework.[2] We take into consideration three pillars of sustainable development based on the ESG sustainability framework (environmental, social, and governance) to define a smart green city comprehensively. The Authority also takes into

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[1] https://www.imd.org/reflections/esg-environmental-social-and-governance-investing-explained/

[2] Chong, K. M., Subramaniam, G., Ating, R., Separa, L. A. C., & Tan, T. H. (2022). Sustainability of smart cities in Malaysia and the Philippines using ESG model. Environment-Behaviour Proceedings Journal, 7(22), 145-155.

consideration an additional economic pillar of sustainable development (environmental, social, governance, and economy ESGE).

(Pagano et al., 2018; Bell and Morse, 2012; Tanguay et al., 2010), argue that to effectively achieve sustainable urban growth, the four sustainability pillars of sustainability should be properly integrated into smart city design, planning, and development.

1.3 Environmental sustainability

Konza Technopolis is situated in a semi-arid location and it faces prolonged periods of high temperatures for most of the year. The Authority's ESG report placed a significant emphasis on environmental stewardship as a central focus. Efforts are being made to reduce our environmental footprint and mitigate the risks associated with climate change through initiatives such as the Konza greening initiative and the development of green infrastructure standards.

1.3.1 Climate Action and Mitigation

The ESG reports articulate our proactive stance on climate change. Emphasizing the potential risks posed by climate change aligns with global sustainability trends while prioritizing the acceleration of the Konza Greening Initiative. , the initiative will leverage technology and partnerships with various stakeholders for resource mobilization towards greening. The greening project will enhance the City's tree coverage as well as contribute to the African Landscape Restoration Initiative. The African Landscape Restoration Initiative was introduced on December 22, 2022,. The aim was to restore 5.1 million hectares of degraded and deforested landscapes. The government, led by H.E. President Ruto, initiated the planting of 15 billion trees by 2032 to reduce greenhouse emissions, stop and reversing deforestation.[3]

The Authority's efforts towards the implementation of Environmental, Social, and Governance (ESG) initiatives involve various actions. These actions aim to integrate cleaner production technologies, ensuring optimal operations and the efficient use of resources for sustainable product development. Additionally, there is an emphasis on supporting environmental endeavors through corporate social responsibility (CSR) programs, contributing to effective environmental management, and supporting

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[3] https://www.treasury.go.ke/appointment-of-kra-commissioner-general/

initiatives that give back to nature. These multifaceted measures collectively demonstrate the Authority's commitment to the comprehensive implementation of ESG initiatives.[4]

1.3.2   Sustainable Infrastructure Development

The emphasis on green infrastructure within the Technopolis is a mandatory requirement outlined in the Konza Masterplan. This master plan highlights the Authority's effort to infuse sustainability into urban development, aligning with global sustainability goals and aiming to foster the creation of environmentally conscious infrastructure.   This aligns with the global sustainability goals, this approach aims to develop an environmentally conscious infrastructure. Urban developing cities face everyday operational issues related to the economy, society, and environment.[5] The Organization for Economic Co-operation and Development (OECD) estimates that USD 6.9 trillion per year is needed up until 2050 for investment in infrastructure to meet development goals and create a low-carbon, climate-resilient future. This means that substantial investment in resilient and sustainable infrastructure is necessary to achieve net zero emissions by 2050 and the Sustainable Development Goals by 2030.[6]

Sustainable infrastructure development is at the core of Konza Technopolis Development Authority's (KOTDA) commitment to Environmental, Social, and Governance (ESG) principles. Within the framework of sustainable infrastructure, the Construction, Operations, and Maintenance (COM) department serves as a vital division, overseeing technical functions related to infrastructural development. Oversight of the COM department is provided by the Technical and Infrastructure Development Committee of the Board, ensuring coordinated efforts in Horizontal Infrastructure, Green Infrastructure, Vertical Infrastructure, and overall sustainability within the Technopolis.

KOTDA's sustainability strategy embraces a collaborative approach, with active involvement from Investors, Contractors, Consultants, Staff, Government Agencies, Development Partners, and other Stakeholders. This collective effort plays a pivotal role in advancing environmentally responsible

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[4] Konza Technopolis Development ESG report 2021

[5] Shahidehpour, M., Li, Z., & Ganji, M. (2018). Smart cities for a sustainable urbanization: Illuminating the need for establishing smart urban infrastructures. *IEEE Electrification magazine*, *6*(2), 16-33.

[6] Songwe, V., Stern, N., & Bhattacharya, A. (2022). Finance for climate action: Scaling up investment for climate and development. *Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science: London, https://www. lse. ac. uk/granthaminstitute/publication/financefor-climate-action-scaling-up-investment-for-climate-and-development*

practices, effective waste management, innovative recycling initiatives, and the development of offsite infrastructure. As cities strive for sustainable futures, Konza Technopolis exemplifies a commitment to resilient and environmentally conscious urban development within the broader context of ESG principles.

1.3.3 Smart City Development

The integration of technology and innovation aims to create an eco-friendly urban landscape, leveraging IoT (Internet of Things) solutions for efficient resource management, energy conservation, and waste reduction.

1.3.3.1 Konza National Data Centre

Supports nationally all IT-dependent solutions and services are complete and operational. The Konza National Data Center certified green building, with tier III infrastructure. LEED (Leadership in Energy and Environmental Design) certification is centered on enhancing energy efficiency in data centers by promoting the utilization of renewable energy sources, efficient lighting, and optimized HVAC systems.[7] This emphasis results in decreased energy consumption and reduced carbon emissions, delivering a positive contribution to the environment. On the other hand, Tier 3 standards mandate redundant power and cooling systems in data centers, prioritizing reliability[8]. Although this may lead to increased energy consumption compared to lower-tier facilities, the environmental impact can be alleviated through the incorporation of energy-efficient technologies and practices.

1.3.3.2 Konza Smart City Facilities

The ongoing implementation of the smart city facilities project at Konza Technopolis aligns seamlessly with the principles of Environmental, Social, and Governance (ESG). This initiative, currently at 40% completion, encompasses key components such as the Integrated Operation Centre (IOC), Intelligent Transport System (ITS), Citywide Network, digital signages, smart meters, and sensors. From an environmental perspective, the project incorporates intelligent systems that optimize operations, enhancing energy efficiency and resource utilization. Socially, the implementation of Intelligent Transport Systems and digital signage contributes to improved urban mobility and public information dissemination[9]. Governance principles are upheld through the

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[7] Moud, H. I., Kibert, C. J., Flood, I., Hakim, H., & Shojaei, A. (2018). Greening Data Centers: Beyond LEED Version 4. In *Construction Research Congress 2018* (pp. 737-747).

[8] Kong, F., & Liu, X. (2014). A survey on green-energy-aware power management for datacenters. *ACM Computing Surveys (CSUR), 47*(2), 1-38.

[9] Paiva, S., Ahad, M. A., Tripathi, G., Feroz, N., & Casalino, G. (2021). Enabling technologies for urban smart mobility: Recent trends, opportunities and challenges. Sensors, 21(6), 2143.

systematic development and integration of these facilities, ensuring transparent and accountable management.

1.3.4   Biodiversity Conservation

In addition to its commitment to urban development, Konza Technopolis places a strong emphasis on the preservation of natural habitats. Initiatives such as the Konza Wildlife Migratory Corridor and various environmental management programs highlight the dedication to biodiversity conservation while concurrently advancing the development of the technopolis. The entirety of the Konza Techno City development has undergone scrutiny through a Strategic Environmental and Social Assessment (SESA), conducted by Perl Frishmann in January 2011. Facilitated on behalf of the International Finance Corporation (IFC), the SESA received approval from the National Environmental Management Authority (NEMA) on February 6th, 2014. [10]This endorsement came with specific provisions, including the obligation to conduct subsequent Environmental Impact Assessment (EIA) studies for distinct development phases within the sanctioned Master Plan, reinforcing the commitment to responsible and sustainable development practices.

1.4   Social Impact

The Authority emphasizes social responsibility, with a particular focus on diversity, and inclusion by focusing on assisting special groups such as youths, women, and people with disabilities. We are committed to fostering an inclusive environment, and our efforts to cultivate a diverse talent pool and facilitate access to procurement opportunities are evidence of this commitment through AGPO. Our environmental, social, and governance (ESG) report, emphasizes the importance of transparent governance and accountability. Our efforts to ensure compliance and risk mitigation are carried out in conjunction with regulatory bodies and oversight agencies. To reaffirm our commitment to responsible governance, we have established our ESG baseline and are continuously monitoring it.

ESG reporting goes beyond simple disclosure; it is an essential component of contemporary business practices, directing us toward actions that are both responsible and sustainable while simultaneously fostering trust among investors and other stakeholders. [11]We at Konza Technopolis are committed

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[10] REPORT, Environmental and Social Monitoring of Konza Techno
City Phase 1 - Construction Phase
[11] Krambia-Kapardis, M., Stylianou, I., & Savva, C. S. (2023). Ethical leadership as a prerequisite for sustainable development, sustainable finance, and ESG reporting. In *Sustainable Finance and Financial Crime* (pp. 107-126). Cham: Springer International Publishing.

to fostering technological progress while simultaneously ensuring the advancement of society and the responsible management of the global environment. Our environmental, social, and governance (ESG) reports serve as a sign of our unwavering dedication to corporate social responsibility (CSR) and sustainability, directing our efforts toward a more positive and sustainable future[12].

1.4.1   Diversity and Inclusion

Our commitment to diversity is evident in our workforce's composition, which comprises individuals from diverse nationalities. The technopolis actively promotes a culture of inclusion and equity, reflecting our commitment to embracing and celebrating differences.

1.4.2   Support for Special Groups

Through initiatives such as Access to Government Procurement Opportunities (AGPO), we actively support youth, women, and people with disabilities (PWDs). Compliance with procurement laws and high-performance evaluations validate the efficacy of these endeavors in supporting underrepresented groups.

1.4.3   Local Content Procurement:

By allocating a significant portion of its procurement budget to local content, we support local production and service procurement. This contributes to the economic growth of the country and aligns with broader sustainability objectives by reducing ecological footprints associated with global sourcing.

1.4.4   Education and Innovation

The focus on establishing science, technology, and innovation parks emphasizes the Authority's endeavor to foster a culture of learning, research, and innovation. These hubs aim to incubate startups, support SMEs, and accelerate the commercialization of cutting-edge ideas, contributing to job creation and economic growth.

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[12] Nandi, A., Agarwala, N., & Sahu, T. N. (2023). Towards a Sustainable Future: The Interaction of Corporate Governance and Sustainable Policies with Corporate Social Responsibility. *Indian Journal of Corporate Governance*, *16*(2), 149-176.

1.4.5 Community Engagement:

Our collaboration with the community and stakeholders extends beyond employment and procurement. They engage in community development initiatives, offering skill development programs, and health services, and supporting local cultural activities, ensuring symbiotic growth.

1.4.6 Employee Engagement and Well-being

The Authority encourages open communication channels where employees feel comfortable expressing their thoughts, concerns, and ideas. Team-building activities and employee satisfaction surveys are conducted to ensure that the employees feel valued, motivated, and empowered to contribute to the success of the Authority.

1.4.7 Health and Safety Programs

KoTDA Prioritizes the well-being of its employees, this is done through the implementation of programs that support the well-being of all the employees. The health and safety programs across all our projects. Training sessions, adherence to safety protocols, and the provision of on-site support systems ensure a secure and conducive working environment. This commitment to maintaining high safety standards shows the Authority's dedication to the welfare of our workforce.

1.4.8 Diversity and Inclusion Initiatives

Promoting a culture of diversity and inclusivity, the Authority has instituted initiatives aimed at celebrating cultural diversity within KoTDA through the compliance of affirmative actions, diversity workshops, and platforms for open dialogue and understanding have been fundamental in fostering inclusivity in KoTDA. These initiatives create an environment where every individual feels valued, respected, and empowered to contribute meaningfully.

1.5 Governance and ESG Accountability

1.5.1 ESG monitoring and implementation

Our collaboration with stakeholders, regulators, and oversight agencies emphasizes the Authority's commitment to adhering to industry-wide ESG standards. These reports provide transparent insights into the organization's practices and serve as a mechanism for ongoing improvement and accountability.

1.5.2 Alignment with National Goals

The technopolis' alignment with Vision 2030 manifests through our focus on cost reduction, job creation, and economic growth. The prioritization of projects supporting micro-, small and medium-sized enterprises (MSMEs) directly contributes to national economic objectives.

1.5.3 Continuous Monitoring and Evaluation

Our commitment to baseline establishment and regular monitoring ensures the sustainability of our initiatives. Through these benchmarks, they track progress, identify areas for improvement, and ensure compliance with ESG goals and industry standards.

1.5.4 Partnerships and Collaboration:

We leverage partnerships with global organizations, educational institutions, and industry experts. Collaborative ventures like the exchange programs with Thunderbird School of Management showcase Konza's commitment to seeking expertise and fostering innovation.

2 Comparative Analysis with Other Organizations' Reports

KoTDA's journey to corporate social responsibility (CSR) and sustainability is evident through the Authority's strategic alignment with global sustainability benchmarks, all while maintaining a distinct focus on our local context. When examining our environmental initiatives, we draw insights from industry giants, Microsoft and Google, highlighting our dedication to green spaces, eco-friendly infrastructure, and the creation of a sustainable city.

The Authourity's strength is the impact of the technopolis to the apart is our primary emphasis on local impact. While companies like Safaricom, East Fork, Microsoft, and Google have a global footprint, our concerted efforts are geared toward enhancing Kenya's technological landscape and fostering economic growth. Our unwavering focus remains on cultivating a technologically advanced ecosystem within Kenya, making significant contributions to the nation's digital economy and innovation.

2.1 local context.

Our initiatives, such as the Kenya Advanced Institute of Science and Technology (KAIST) and the Jitume Programme, signify our commitment to nurturing a skilled workforce and empowering the youth for the digital future. Through our evaluation metrics and frameworks, the Authority analyzes

beyond financial risks, identifying priorities through materiality assessments, thematic issues, and alignment with the UN's Sustainable Development Goals. This approach allows us to focus on sustainable infrastructure, digitalization, education, and employment, ensuring our efforts are aligned with global sustainability objectives.

2.2 Evaluation Metrics and Frameworks

Konza Technopolis employs various metrics and frameworks to assess its CSR and sustainability impact. These align with Global Reporting Initiative (GRI) principles and include:

2.2.1 Materiality Assessment

An analysis beyond financial risk parameters, considering administrative, operational, and project priorities. This process helps identify key focus areas for sustainability.

2.2.2 Thematic Issues

Identified through consultations, interviews, and surveys, focusing on critical areas such as sustainable infrastructure, digitalization, education, and employment.

2.2.3 Sustainable Development Goals (SDGs)

Aligning with the UN SDGs, particularly Goal 9 (Industry, Innovation, and Infrastructure), serves as a guideline for sustainability initiatives.

2.3 Measurable Outcomes

2.3.1 Projected Jobs

The Authority aims to create over 17,000 jobs upon Phase 1 operationalization, contributing approximately 2% to Kenya's national income.

2.3.2 Population Impact

Projections indicate a population of 30,000+ during Phase 1 and substantial growth to 240,000+ at full buildout, indicating the economic and social development the project envisions.

2.4 Risk Management and Contingency Plans

Our commitment to sustainability involves an in-depth analysis of potential risks that could impact our initiatives. Financial risks, environmental hazards, regulatory changes, and social challenges are thoroughly assessed to ensure robust risk management.

2.4.1 Financial Risks

We acknowledge the potential financial risks associated with large-scale infrastructure projects. To mitigate these, we maintain diversified investment portfolios and continuously monitor and analyze financial trends. This approach ensures we adapt swiftly to market fluctuations and mitigate any unforeseen financial impacts.

2.4.2 Environmental Hazards

Recognizing the importance of environmental sustainability, we've instituted comprehensive measures to address environmental risks. Contingency plans are in place to respond to natural disasters, minimize ecological footprints, and promote eco-friendly practices across all operational facets.

2.4.3 Regulatory Changes

Constant changes in regulations can significantly impact our operations. We closely monitor evolving regulatory landscapes, ensuring strict adherence to compliance requirements. This proactive approach enables us to adapt swiftly to changes, minimizing disruption to our sustainability objectives.

2.4.4 Social Challenges

Our commitment extends beyond physical infrastructure; we're deeply invested in fostering inclusive and socially responsible practices. This involves addressing social challenges through community engagement programs, promoting diversity, and ensuring equitable access to opportunities.

2.5 Partnerships and Collaborations

2.5.1 Academic Partnerships

Our collaboration with esteemed academic institutions has been pivotal in propelling research and innovation. Partnering with universities has led to joint ventures focused on developing sustainable technology and advancing urban planning methodologies. These collaborations foster a conducive environment for knowledge exchange, infusing our strategies with academic expertise and innovative ideas. Through joint projects, we've explored groundbreaking solutions to sustainability challenges, aligning with our mission to create a technologically advanced and environmentally conscious ecosystem.

2.5.2 Industry Collaborations

Engaging with industry leaders has been integral to embedding sustainable practices within our projects. Collaborations with leading construction firms, renewable energy providers, and waste management companies have allowed us to integrate cutting-edge technologies and best practices into our infrastructure development. These partnerships facilitate the adoption of innovative approaches, ensuring that our projects are designed and executed with environmental considerations at the forefront. By leveraging industry expertise, we drive the implementation of sustainable solutions across various facets of our operations.

2.5.3 Environmental Conservation Efforts

Our partnerships with environmental NGOs and conservation organizations underscore our commitment to ecosystem preservation. Collaborative initiatives focusing on biodiversity conservation, afforestation, and wildlife protection have been instrumental in shaping our sustainability goals. By actively engaging with these organizations, we've developed comprehensive strategies to minimize our ecological footprint and contribute positively to environmental conservation. These partnerships serve as a cornerstone in our pursuit of creating a greener and more sustainable environment within Konza Technopolis.

3   Conclusion

Although there is limited empirical evidence that sustainability reporting in smart cities leads to improved performance, cities cannot be really smart without being sustainable (Yigitcanlar et al., 2019).

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