



**SUSTAINABLE
INFRASTRUCTURE
PARTNERSHIP**



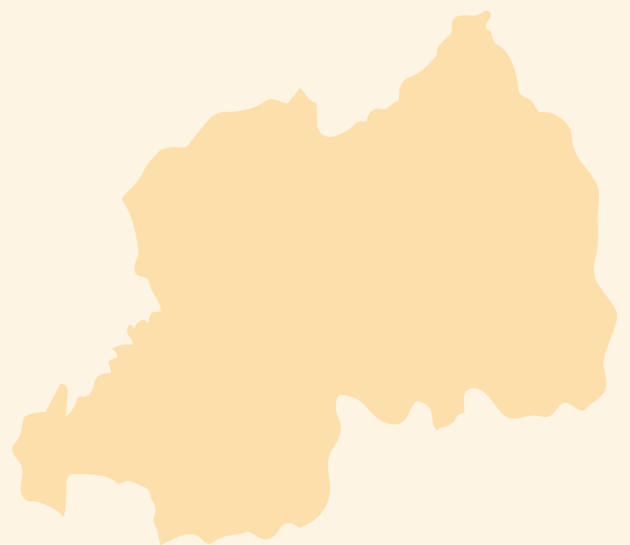
Republic of Rwanda
Ministry of Environment



CENTRE OF KIGALI, RWANDA ©FCG/Shutterstock.com

RWANDA

**STRATEGIC PLANNING
FOR RWANDA'S URBAN
INFRASTRUCTURE**



2022

The International Good Practice Principles for Sustainable Infrastructure

set out ten guiding principles that policymakers can follow to help integrate sustainability into infrastructure planning and delivery. They are focused on integrated approaches and systems-level interventions that governments can make to create an enabling environment for sustainable infrastructure. This case study illustrates specific aspects of one principle in a country context, showing good practices and challenges, and considering potential for advancement or replicability.

GUIDING PRINCIPLE 1: STRATEGIC PLANNING

Infrastructure development decisions should be based on strategic planning that is aligned with global sustainable development agendas and supported by enabling policies, regulations and institutions that facilitate coordination across departments and both national and sub-national levels of government administration.

BACKGROUND

The Government of Rwanda's (GoR) development vision emphasizes the importance of environmental protection, natural resource management and climate change preparedness. The GoR has thus embraced a Green Growth strategy for the country. The Government's vision for Kigali's infrastructure, outlined in the Kigali Master Plan, mirrors this country-level strategy of Green Growth. In addition to developing Kigali and Rwanda in a way that secures the country's natural assets, Rwanda is also committed to creating accessible green and open spaces for its citizens and visitors. Rwanda's Vision 2050 outlines a target for 25% of Kigali City to be turned into recreational spaces, and to create a park in every neighbourhood with 2,000 - 50,000 inhabitants.

Rwanda's population is close to 13 million, with an annual growth rate of 2.86%; its urbanization rate is expected to increase from the current rate of 18.41% to 35% by 2024 (Gubic and Baloi 2020). Kigali City is predicted to have the highest population density in the country, which calls for strategic planning of infrastructure (Rwanda, Ministry of Environment 2020). As Rwanda urbanizes, the GoR is committed to planning more urban recreation and green space to ensure healthy and environmentally friendly lifestyles for its citizens. In Kigali, this includes the protection and sustainable development of Kigali's wetland system, which will also help significantly with flood mitigation from rainwater run-off.

STRATEGIC ORIENTATION ON SUSTAINABLE INFRASTRUCTURE

Between 2013 and 2018 green space and recreational areas in Kigali decreased; the Kigali Master Plan outlines various measures to reverse this. Pillar 6 covers Green Growth, and the vision of Kigali's "Green City" outlined in the plan includes: acknowledging the natural landscape of the city; protecting sensitive ecological areas from urban growth; restoring damaged natural elements like water bodies; adopting natural resource management systems; green building initiatives; forest protection strategies; steep slope protection strategies; and a "green and blue" plan, a hierarchy of parks and connectors.

Kigali is surrounded and traversed by several streams, rivers and lakes and is delineated into 25 watershed areas. Serving as "natural infrastructure", these water bodies provide valuable water supplies, drain stormwater, and contribute to the physical beauty and character of Kigali. Urban development and land cover change are increasing the impermeable surfaces in Kigali's catchments, leading to increased stormwater run-off and localized flooding. This compounds the existing challenge of flash flooding and landslide risks associated with the hilly topography and steep slopes of the city, causing significant damage, cost and loss of life (Rwanda, Ministry of Finance and Economic Planning 2020).

KIGALI MASTER PLAN ALIGNS WITH NATIONAL AND UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

The Kigali Master Plan contains eight themes that are in line with the overall national strategy, and that resonate with the four National Urban Planning pillars (Coordination, Densification, Conviviality and Economic Growth). These themes are the new goals of the Revised Master Plan: 1. City of Excellence; 2. City on The Move; 3. Efficient City; 4. Green City; 5. City at Work; 6. Creative City; 7. City for Citizens; and 8. Cities in an Integrated District. The eight goals are the foundation of the overall Master Plan. They form the backbone of all approaches and interventions considered in the implementation of this plan, and align with United Nations (UN) Sustainable Development Goals 22 (Sustainable Cities and Communities) and 15 (Life on Land) in particular (UN Department of Economic and Social Affairs 2020). For example, part of the Master Plan is to bring various benefits and infrastructure services to the community through managing wetlands which have the capacity to provide water supply, flood control, climate mitigation and wastewater treatment. They are also important habitats for biodiversity, agriculture and fisheries. This relates closely to SDG targets 15.1 and 15.9, concerning conservation, restoration and sustainable use of inland freshwater ecosystems and their services, and integrates ecosystem and biodiversity values into national and local planning.

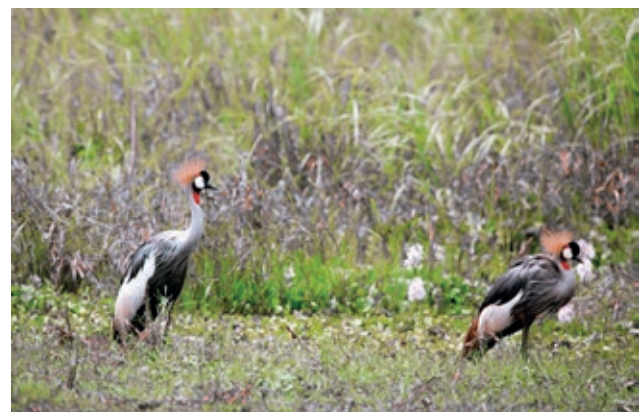
NYANDUNGU URBAN WETLAND ECO-TOURISM PARK

Nyandungu Urban Wetland Eco-Tourism Park (NUWEP) represents an example of a sustainable infrastructure project implemented in the context of the Kigali Master Plan. It is shared by the administrative sectors of Nyarugunga (Kicukiro District), Ndera and Kimironko (Gasabo District) in Kigali city. The wetland is approximately 130 hectares and has a total perimeter of 6,730.8 metres, located north of the Kigali International Airport. The Nyandungu wetland is drained by two streams: Mwanana and Kabagenda. Both flow into the Mulindi stream, a tributary of the Nyabarongo River.

The Nyandungu wetland was historically used for agricultural and pastoral activities. The wetland was polluted with sewage outflow from surrounding neighbours, as well as pollutants from road run-off, the industrial zone and urban development. The Ministry of Environment, through the Rwanda Environmental Management Authority, has prioritized development

of NUWEP in partnership with the Rwanda Green Fund (FONERWA), the Italian Government through the Italian Ministry of Ecological Transition and the Global Environmental Facility (GEF) to provide the following functions: a) preserve the ecological function of the wetland; b) provide flood control and mitigation; c) improve the air quality and other environmental health for the surrounding community and Kigali City; d) provide space for education, recreation and contemplation and e) apply state of the art practices for environmental, economic, and social sustainability.

The previously bushy and stagnated Nyandungu wetland is gradually shaping up into a reclaimed Urban Wetland Eco-Tourism Park that will be utilized by Kigali dwellers as a place for meditation and reconnecting with nature while escaping from stress, and is a demonstration of sustainable infrastructure in the natural environment. It is composed of ornamental ponds, gallery forests, a medicinal plant garden, paved walkways and cycle lanes, a restaurant, information centre, and recreational and other biodiversity services. It aims to attract both foreign and local visitors.



POND & SPECIES

The birds in the wetland are a short-term indicator that the restoration is successful and that the park has a healthy ecosystem. There are water birds, wading birds, birds of prey and a wide spectrum of others. Of those seen, some are residents while others are migrators.

The walls are made of volcanic stones and the wooden parts (floor, stairs and ramps) are made of local *muvula* wood. There is green metallic signage with the NUWEP logo and louvres for natural ventilation and lighting. The restaurant is equipped with a solar panel for energy, a plastic tank to collect rainwater and large folding aluminum doors that can be opened, depending on the weather.

REPLICABILITY

By virtue of strategic planning at the national and city levels, Rwanda has already established urban infrastructure projects that successfully integrate the built and natural environments. The Government of Rwanda in partnership with the World Bank, GEF and the Nordic Development Fund will now undertake rehabilitation of five wetlands in the City of Kigali under the Second Rwanda Urban Development Project (RUDP II). Such projects highlight the importance of first setting clear long-term priorities, goals and targets, which provide the necessary frameworks for implementing sustainable infrastructure on the ground.



NYANDUNGU RESTAURANT

KEY INSIGHTS



- > At a national and city level, Rwanda has devised strategic plans embracing Green Growth in response to projected rapid urbanization.
- > The Kigali Master Plan emphasizes green space, recreational areas and harnessing natural landscapes to provide infrastructure services.
- > The creation of Nyandungu Urban Wetland Eco-Tourism Park is part of Rwanda's efforts to restore and conserve ecosystems while promoting socio-economic development. Once completed, Nyandungu Urban Wetland Eco-Tourism Park will become Kigali's main public open space.

ACKNOWLEDGEMENTS

The Sustainable Infrastructure Partnership (SIP) is a platform led by the United Nations Environment Programme (UNEP) to promote and support integrated approaches to sustainable infrastructure planning and development. This case study was developed by Vanessa Umotoni, Sheri Alphonsine, Beatrice Cyiza, William Mugabo and Anabella Umuhoya Kayihura (Rwanda, Ministry of Environment), with guidance from Fulai Sheng, Rowan Palmer, Joseph Price and Shunsuke Nakai (all UNEP). The SIP would like to thank Maximilian Beck, Pak Yin Choi, Ana Fernández Vergara and Désirée Leon (all UNEP) for their support. The case study was copyedited by Frances Meadows and laid out by Shanshan Xu (both UNESCO).

REFERENCES

- Government of Rwanda (2017). *7 Years Government Programme: National Strategy for Transformation (NST1) 2017–2024*. https://www.greengrowthknowledge.org/sites/default/files/downloads/policy-database//NST1_7YGP_Final.pdf.
- Gubic, I. and Baloi, O. (2020). Public open space initiatives for healthier cities in Rwanda. *The Journal of Public Space*, 5(2): 129-146. DOI: <https://doi.org/10.32891/jps.v5i2.1287>.
- Nile Basin Initiative (2013). Rwanda wetlands governance and management profile. <https://chm.cbd.int/api/v2013/documents/6EC46755-C2FF-9FFF-AF37-7FA66D88638E/attachments/213149/Rwanda-Wetlands-Governance-and-Management-Profile%202019.pdf>.
- Rwanda, Environmental Management Authority (2012). *Study for establishing urban wetland recreation and eco-tourism park in Nyandungu Valley, Kigali City (Rwanda)*: final report. https://rema.gov.rw/fileadmin/templates/Documents/rema_doc/publications/Planning%20docs/Nyandungu%20wetland%20plan_2012.pdf.
- Rwanda, Environmental Management Authority (2011). *Green Growth and Climate Resilience National Strategy for Climate Change and Low Carbon Development*. https://www.rema.gov.rw/rema_doc/RGG&CRS%202011/Rwanda%20Green%20Growth%20Strategy%20FINAL%20high%20res.pdf.
- Rwanda, Ministry of Environment (2020). *National Land Use and Development Master Plan: NLUDMP 2020-2050*. <https://www.environment.gov.rw/index.php?eID=dumpFile&t=f&f=10551&token=ef94f9c2e05dfb6b5e43acfdaaefa0dfe0071380>.
- Rwanda, Ministry of Finance and Economic Planning (2020). *Vision 2050* https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/REPORTS/National_Development_Planning_and_Research/Vision_2050/English-Vision_2050_Abridged_version_WEB_Final.pdf.
- United Nations Department of Economic and Social Affairs (2020). Sustainable Development Goals. <https://sdgs.un.org/goals>. (Accessed on 29 April 2022).
- United Nations Environment Programme (2022). International Good Practice Principles for Sustainable Infrastructure. Nairobi: UNEP.
- United States Agency for International Development (2015). Balancing wetland sustainable use and protection through policy in Rwanda. Policy research brief No. 5. https://www.land-links.org/wpcontent/uploads/2016/09/USAID_Land_Tenure_Rwanda_Policy_Research_Brief_No-5.pdf.