

Biodiversity Conservation in Town: Greening African Cities for One Health and Climate Mitigation

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Climate Mitigation**

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Biodiversity Conservation in Town?: Greening African Cities for One Health and Climate Mitigation

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Abstract

This paper discusses how Africa can achieve sound biodiversity conservation by greening its cities. The paper observes that Africa is witnessing a rapid pace of urbanization which bring numerous opportunities for the continent's growth. However, the paper also notes that without adequate planning, the growth of cities and urban centres in Africa can undermine biodiversity conservation efforts. The paper discusses the impact of cities and urban centres in Africa on biodiversity. In light of underlying concerns, the paper examines effective pathways towards greening African cities for One Health and climate mitigation while ensuring sound biodiversity conservation.

1.0 Introduction

Sound biodiversity conservation is a prerequisite for Sustainable Development. It has been observed that biodiversity forms the web of life, of which humans are integral and upon which people and the planet depend on for their health and well-being¹. The United Nations observes that humanity depends on biodiversity for its survival and well-being since it provides and sustains food, water, medicine, clean air and a stable climate². In addition, biodiversity is at the heart of global economic growth since over half of the world's Gross Domestic Product (GDP) is dependent on nature³.

Biodiversity, encompassing the variety of life forms on Earth, including variety of genes, species, ecosystems, and ecological processes, therefore plays an important role in unlocking Sustainable Development⁴. According to the United Nations Environment Programme (UNEP), biodiversity underpins food security, human health and economic growth⁵. It also provides vital ecosystem services including climate regulation, natural filtration of water and pollination which support both human and ecosystem health⁶. Biodiversity therefore sustains life on Earth since species and organisms work together in ecosystems, like an intricate web, to maintain balance and support life on the planet⁷.

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¹ United Nations Environment Programme., 'UNEP and Biodiversity' Available at <https://www.unep.org/unep-and-biodiversity#:~:text=Biological%20diversity%20is%20the%20variety.of%20human%20influence%20as%20well> (Accessed on 15/04/2026)

² United Nations., 'Biodiversity - our strongest natural defense against climate change' Available at <https://www.un.org/en/climatechange/science/climate-issues/biodiversity> (Accessed on 15/04/2026)

³ Ibid

⁴ Tula. A., & Bandera. A.D., 'Biodiversity and Sustainable Development (SD): A Literature Review' Available at https://www.globalscientificjournal.com/researchpaper/BIODIVERSITY_AND_SUSTAINABLE_DEVELOPMENT_SD_A_LITERATURE_REVIEW.pdf (Accessed on 15/04/2026)

⁵ United Nations Environment Programme., 'Biodiversity: our solutions are in nature' Available at <https://www.unep.org/news-and-stories/story/biodiversity-our-solutions-are-nature> (Accessed on 15/04/2026)

⁶ Ibid

⁷ World Wildlife Fund., 'What is Biodiversity?' Available at <https://www.worldwildlife.org/pages/what-is-biodiversity#:~:text=Biodiversity%20is%20all%20the%20different,maintain%20balance%20and%20support%20life>. (Accessed on 15/04/2026)

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However, it has been observed that nature is in crisis with the world currently losing species at a rate 1,000 times greater than at any other time in recorded human history⁸. In particular, it is estimated that one million species are facing the risk of extinction⁹. In addition, key ecosystems including tropical forests, wetlands, mangroves, grasslands, rivers and lakes and salt marshes are being degraded due to human activities threatening biodiversity and crucial ecosystem services¹⁰.

In light of the foregoing concerns, sound biodiversity conservation is an important global ideal in the quest towards Sustainable Development. This ideal is envisaged under the United Nations *2030 Agenda for Sustainable Development*¹¹ which acknowledges the crucial role of biodiversity in sustaining life on Earth. Under the Agenda, Sustainable Development Goal (SDG) 15 seeks to *inter alia* halt the loss of biodiversity for Sustainable Development¹². It urges countries to take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity, and protect and prevent the extinction of threatened species¹³. Strengthening biodiversity conservation is therefore vital if the Sustainable Development agenda is to be achieved.

This paper discusses how Africa can achieve sound biodiversity conservation by greening its cities. The paper observes that Africa is witnessing a rapid pace of urbanization which bring numerous opportunities for the continent's growth. However, the paper also notes that without adequate planning, the growth of cities and urban centres in Africa can undermine biodiversity conservation efforts. The paper discusses the impact of cities and urban centres in Africa on biodiversity. In light of underlying concerns, the paper examines effective pathways towards greening African cities for One Health and climate mitigation while ensuring sound biodiversity conservation.

2.0 Urbanization in Africa: Opportunities and Challenges

The United Nations Human Settlements Programme (UN-Habitat) observes that urbanization is one of the most significant trends of the 21st century with nearly 55 percent of the world's population currently living in cities and urban areas¹⁴. Further, it is projected that by 2030, 6 out of 10 people will be urban dwellers¹⁵. This figure is expected to rise by 2050, where 6.5 billion people will be living in cities and urban areas, representing nearly two-thirds of the global population¹⁶. The United Nations observes that the

⁸ United Nations Environment Programme., 'Biodiversity: our solutions are in nature' Op Cit

⁹ Ibid

¹⁰ United Nations Environment Programme., 'UNEP and Biodiversity' Available at <https://www.unep.org/unep-and-biodiversity#:~:text=Biological%20diversity%20is%20the%20variety.of%20human%20influence%20as%20well> (Accessed on 15/04/2026)

¹¹ United Nations General Assembly., 'Transforming Our World: the 2030 Agenda for Sustainable Development.' 21 October 2015, A/RES/70/1., Available at <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> (Accessed on 15/04/2026)

¹² Ibid

¹³ Ibid

¹⁴ United Nations-Habitat., 'Sustainable Development Goals- Cities' Available at <https://unhabitat.org/programme/sdg-cities#:~:text=However%2C%20if%20steered%20and%20deployed,and%20improve%20wellbeing%20for%20all> (Accessed on 15/04/2026)

¹⁵ Monitoring Human Settlement Indicators., 'A Short Guide to Human Settlements Indicators Goal 11+' Available at <https://www.local2030.org/library/296/A-short-guide-to-Human-Settlements-Indicators-Goal-11.pdf> (Accessed on 15/04/2026)

¹⁶ Ibid

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world has become increasingly urban with more people living in cities¹⁷. It has been observed that globally, more people live in cities than in towns or in rural areas¹⁸.

Urbanization is also a growing phenomenon in Africa. UN-Habitat observes that currently, Africa has an average annual urban growth rate of 3.5 percent and is witnessing the largest urbanization in the developing world with this trend anticipated to continue until the year 2050¹⁹. It is estimated that Africa's urban population will double, increasing from 700 million to 1.4 billion by 2050, making it the continent with the second largest urban population after Asia²⁰. It has been observed that more than 60 African cities now have populations of over 1 million—on par with Europe²¹. Further, it has been pointed that by 2050, nearly 159 cities in Africa will have populations of over 1 million²².

The rapid growth of cities both globally and in Africa provides immense opportunities for human progress and prosperity. For example, cities have been identified as hubs for ideas, commerce, culture, science, productivity, social, human and economic development²³. Cities act as engines of national economic development²⁴. It has been argued that strong urban economies are necessary in poverty reduction and the provision of vital services including adequate housing, transport and infrastructure, water and sanitation, health, education and safety²⁵. The growth of cities in Africa therefore provides opportunities to spur socio-economic growth and pull millions of people out of poverty. It has been observed that with proactive planning, effective governance and innovative financing, African cities can become engines of inclusive socio-economic growth and development²⁶.

However, the rapid growth of cities in Africa also raises several concerns. For instance, it has been pointed out that many cities all over the world are struggling with environmental degradation, inadequate urban infrastructure, and inadequate access to basic urban services including water supply, sanitation, health and waste management²⁷. In particular, the rapid growth of cities in Africa has failed to bring inclusive and equitable growth which, in turn, has resulted in the growth of slums, urban poverty and rising inequalities²⁸. It has been observed that most African cities have seen the growth of informal settlements, where people

¹⁷ United Nations., 'The World's Cities in 2025' Available at https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2025_data-booklet_world_cities_in_2025.pdf (Accessed on 15/04/2026)

¹⁸ Ibid

¹⁹ United Nations Economic Commission for Africa., 'Spotlight on urbanization in Africa' Available at <https://www.uneca.org/eca-events/africa-urban-forum-2024/spotlight-urbanization-africa> (Accessed on 15/04/2026)

²⁰ Organisation for Economic Co-Operation and Development., 'Africa's Urbanisation Dynamics 2025' Available at https://www.oecd.org/en/publications/africa-s-urbanisation-dynamics-2025_2a47845c-en.html#:~:text=Over%20the%20next%20three%20decades,urban%20planning%2C%20governance%20and%20financing. (Accessed on 15/04/2026)

²¹ Africa Center for Strategic Studies., 'Africa's Unprecedented Urbanization is Shifting the Security Landscape' Available at <https://africacenter.org/spotlight/africa-urban-growth-security/> (Accessed on 15/04/2026)

²² Ibid

²³ United Nations., 'Sustainable Cities and Human Settlements' Available at <https://sdgs.un.org/topics/sustainable-cities-and-human-settlements> (Accessed on 15/04/2026)

²⁴ United Nations-Habitat., 'The Economic Role of Cities' Available at <https://unhabitat.org/sites/default/files/download-manager-files/Economic%20Role%20of%20Cities.pdf> (Accessed on 15/04/2026)

²⁵ Ibid

²⁶ Organisation for Economic Co-Operation and Development., 'Africa's Urbanisation Dynamics 2025' Op Cit

²⁷ United Nations Environment Programme., 'Sustainable Cities' Available at <https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/sustainable-cities> (Accessed on 15/04/2026)

²⁸ African Development Bank Group., 'Urbanization in Africa' Available at <https://blogs.afdb.org/fr/inclusive-growth/urbanization-africa-191> (Accessed on 15/04/2026)

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do not have reliable, safe or affordable access to essential everyday services including housing, clean water, sanitation services, healthcare, infrastructure and waste management services²⁹.

African cities are also struggling with mounting environmental threats. For instance, it has been observed that many cities in Africa are located along coasts and major rivers, exposing citizens to adverse weather and climatic events including sea-level rise and extreme flooding³⁰. In addition, destruction of ecosystems and habitats including forests, wetlands and grasslands to support the growth of cities in Africa is also leading to biodiversity loss with severe impacts on people and planet³¹. Further, many African cities are struggling with solid waste management exposing residents to health threats with solid waste also devastating ecosystems and habitats thus impacting biodiversity³². Air pollution is also a major environmental concern in African cities exposing residents to adverse health impacts. It has been observed that air quality in African cities has been steadily declining over the past years and decades as urbanization accelerates in the continent³³. Industrialization, urban traffic, household fuel combustion and illegal dumping and burning of waste contribute to air pollution in African cities with negative health impacts including premature deaths and respiratory infections³⁴.

It is therefore necessary to address the foregoing challenges in order to foster healthy, resilient and sustainable African cities.

3.0 Greening African Cities for Biodiversity Conservation, One Health and Climate Mitigation

The rapid pace of urbanization in Africa brings along both opportunities and challenges. For example, if well-designed, African cities can be hubs of growth, development, prosperity and poverty reduction³⁵. However, due to poor planning, African cities are struggling with several challenges including inadequate access to basic urban services including water supply, sanitation, health and waste management³⁶. Further, African cities are highly vulnerable to environmental threats including climate change, pollution and biodiversity loss³⁷. In light of these environmental threats, it is imperative to green African cities towards ensuring the health and well-being of city residents.

It has been observed that greening cities is a key agenda globally towards enhancing urban biodiversity, confronting climate change, and improving the health and well-being of citizens by promoting sustainable urban green spaces and nature-based solutions in urban areas³⁸. By greening cities, it is possible to create sustainable livelihoods through access to green jobs, confront climate change by reducing greenhouse gas emissions, improve biodiversity in urban areas and increase access to sustainable infrastructure and

²⁹ World Resources Institute., 'Sustainable Cities: Building Urban Resilience and Inclusive Mobility' Available at <https://africa.wri.org/cities> (Accessed on 15/04/2026)

³⁰ Ibid

³¹ African Development Bank Group., 'Urbanization in Africa' Op Cit

³² Ibid

³³ United Nations-Habitat., 'Air Quality in African Cities' Available at <https://unhabitat.org/air-quality-in-african-cities> (Accessed on 15/04/2026)

³⁴ Clean Air Fund., 'Nairobi and Air Pollution' Available at <https://www.cleanairfund.org/clean-air-african-cities/nairobi-and-air-pollution/> (Accessed on 15/04/2026)

³⁵ African Development Bank Group., 'Urbanization in Africa' Op Cit

³⁶ Ibid

³⁷ Ibid

³⁸ Greening Cities., Available at <https://www.urbanagenda.urban-initiative.eu/partnerships/greening-cities> (Accessed on 16/04/2026)

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services in cities³⁹. Greening cities is a key theme under the *New Urban Agenda*⁴⁰. The Agenda lays out standards and principles for the planning, construction, development, management and improvement of cities and urban areas towards sustainability⁴¹. In particular, the Agenda notes that enhancing access to safe, inclusive and green public spaces in cities is vital towards enhancing the health and well-being of citizens⁴². In addition, African Union's *Agenda 2063*⁴³, sets out the ideal of clean, healthy, resilient, inclusive and sustainable cities and urban areas in Africa towards development and human progress⁴⁴.

Greening cities is therefore a key agenda both globally and in Africa. In order to green African cities, it is imperative to enhance access to quality, safe and inclusive urban green spaces⁴⁵. Urban green spaces refer to areas with vegetation within or partly embraced by urban fabric⁴⁶. They include gardens, parks, green inner spaces of city blocks, city squares with greenery, ponds, lakes and small water bodies located in urban areas⁴⁷. Urban green spaces provide numerous benefits towards biodiversity conservation, One Health and climate mitigation. For example, it has been observed that urban green spaces ensure that urban residents have adequate exposure to nature therefore fostering human health and well-being⁴⁸. According to the World Health Organization (WHO), modern life style especially in urban areas is associated with chronic stress, insufficient physical activity and exposure to anthropogenic environmental hazards⁴⁹. As a result, it has been suggested that urban green spaces, such as parks, playgrounds, and residential greenery can address this challenge by promoting mental and physical health, and reducing morbidity and mortality in urban residents by providing psychological relaxation and stress alleviation, stimulating social cohesion, supporting physical activity, and reducing exposure to air pollutants, noise and excessive heat⁵⁰. Urban green spaces have been linked to better physical and mental health, reduced stress levels and stronger social cohesion⁵¹.

In addition, urban green spaces can support biodiversity conservation in cities and urban areas. For instance, it has been observed that urban green spaces including parks, urban forests, gardens, street trees and green roofs support biodiversity by providing food and shelter across the urban landscape⁵². In cities and urban areas, green spaces are essential for fostering stable habitats and resources for wildlife, thereby enhancing the quality of urban biodiversity and ecosystems⁵³. Urban green spaces offer vital sanctuaries

³⁹ Global Green Growth Initiative., 'Green Cities' Available at <https://gggi.org/theme/green-cities/> (Accessed on 16/04/2026)

⁴⁰ United Nations Human Settlements Programme (UN-Habitat)., 'The New Urban Agenda' Available at https://unhabitat.org/sites/default/files/2020/12/nua_handbook_14dec2020_2.pdf (Accessed on 16/04/2026)

⁴¹ Ibid

⁴² Ibid

⁴³ African Union., 'Agenda 2063: The Africa we Want' Available at Available at https://au.int/sites/default/files/documents/33126-doc-framework_document_book.pdf (Accessed on 16/04/2026)

⁴⁴ Ibid

⁴⁵ African Development Bank Group., 'Urbanization in Africa' Op Cit

⁴⁶ Concept: Urban Green Space Ecology., Available at <https://netzerocities.app/resource-3308> (Accessed on 16/04/2026)

⁴⁷ Ibid

⁴⁸ World Health Organization., 'Urban Green Spaces: A Brief for Action' Available at <https://iris.who.int/bitstream/handle/10665/344116/9789289052498-eng.pdf> (Accessed on 16/04/2026)

⁴⁹ World Health Organization., 'Urban Green Spaces and Health' Available at <https://www.who.int/europe/publications/i/item/WHO-EURO-2016-3352-43111-60341> (Accessed on 16/04/2026)

⁵⁰ Ibid

⁵¹ Why Urban Green Spaces Matter: Lessons from the Green Belt Movement., Available at <https://www.greenbeltmovement.org/why-urban-green-spaces-matter-lessons-from-the-green-belt-movement/> (Accessed on 16/04/2026)

⁵² Eger. M., 'Urban oases: the social-ecological importance of small urban green spaces' Available at <https://www.tandfonline.com/doi/full/10.1080/26395916.2024.2315991#abstract> (Accessed on 16/04/2026)

⁵³ Wu. C., O'Keefe. J., & Ding. Y., 'Biodiversity of urban green spaces and human health: a systematic review of recent research' *Frontiers in Ecology and Evolution.*, Volume 12, 2024

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for biodiversity, providing habitats for diverse plant and animal species in urban areas⁵⁴. They serve as vital habitats, wildlife corridors, and ecological buffers in urban environments, supporting a wide range of plant and animal species⁵⁵. It has been noted that the biodiversity of urban green spaces plays a huge role in improving human health and well-being and achieving sustainable urban development⁵⁶. Nurturing urban green spaces in African cities is therefore key towards biodiversity conservation.

Further, urban green spaces in African cities can support climate mitigation. It has been noted that well-functioning urban green spaces including urban forests, parks, gardens and green roofs absorb greenhouse gas emissions therefore playing a vital role in combating climate change⁵⁷. In addition, urban green spaces also reduce urban heat island effects while also providing effective nature-based solutions that can cushion residents in cities from the adverse impacts of climate change⁵⁸.

Building and maintaining urban green spaces is therefore vital towards greening African cities. These spaces can support biodiversity conservation, One Health and climate mitigation. It is therefore imperative to enhance access to urban green spaces including urban forests, green roofs, green walls, urban parks and gardens towards greening African cities for biodiversity conservation, One Health and climate mitigation⁵⁹.

In addition, African cities have been urged to utilise nature-based solutions towards improving the quality of life for residents while also tackling environmental threats⁶⁰. Nature-based solutions involve working with nature to address societal challenges, support human health and well-being and conserve biodiversity⁶¹. It has been observed that nature-based solutions leverage nature and the power of healthy ecosystems to protect people, optimise infrastructure and safeguard a stable and biodiverse future⁶². It has been pointed out that cities can adopt nature-based solutions for sustainable urban development including through planting trees to improve urban air quality, converting abandoned industrial sites into urban parks and gardens, greening roofs to reduce buildings' energy use, and restoring degraded wetlands to prevent floods⁶³. Further, it has been observed that cities in coastal areas which suffer from coastal flooding and erosion can benefit from nature-based solutions through the restoration and management of saltmarshes, wetlands, mangroves and oyster reefs among other coastal/marine ecosystems for people and planet⁶⁴. These ecosystems providing effective nature-based solutions by acting as natural buffers

⁵⁴ Usoh. A., 'Nurturing Nature: The Role of Urban Green Spaces in Preserving Biodiversity' Available at <https://medium.com/@fascinakon/nurturing-nature-the-role-of-urban-green-spaces-in-preserving-biodiversity-0d16f94c16b6> (Accessed on 16/04/2026)

⁵⁵ Ibid

⁵⁶ Zhao. X et al., 'Biodiversity in Urban Green Space: A Bibliometric Review on the Current Research Field and its Prospects' *Int J Environ Res Public Health*, 2022 Oct 1;19(19):

⁵⁷ Jabbar. M., Yusoff. M.M., & Shafie. A., 'Assessing the Role of Urban Green Spaces for Human Well-Being: a Systematic Review' Available at <https://link.springer.com/article/10.1007/s10708-021-10474-7> (Accessed on 16/04/2026)

⁵⁸ Ibid

⁵⁹ African Development Bank Group., 'Urbanization in Africa' Op Cit

⁶⁰ Ibid

⁶¹ What is the Nature-based Solutions Initiative and what are nature-based solutions?., Available at <https://www.naturebasedsolutionsinitiative.org/what-are-nature-based-solutions#:~:text=Examples%20of%20Nature%2Dbased%20Solutions&text=Protecting%20or%20restoring%20forests%20and%20flooding%20soil%20erosion%20and%20landslides> (Accessed on 16/04/2026)

⁶² International Union for Conservation of Nature., 'Nature-Based Solutions' Available at <https://iucn.org/our-work/nature-based-solutions> (Accessed on 16/04/2026)

⁶³ Nature-based solutions for sustainable urban development., Available at https://unfccc.int/files/parties_observers/submissions_from_observers/application/pdf/777.pdf (Accessed on 16/04/2026)

⁶⁴ Ibid

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against sea-level rise, storm surges and erosion⁶⁵. Leveraging on nature-based solutions is therefore vital towards greening African cities for people and planet.

4.0 Conclusion

Greening African cities is a key agenda towards fostering sustainable urban development for biodiversity conservation, One Health and climate mitigation. Achieving this goal involves enhancing access to quality, safe, modern and inclusive urban green spaces such as urban forests, green roofs, green walls, urban parks and gardens while also harnessing nature-based solutions to tackle environmental challenges in African cities⁶⁶. Greening African cities is therefore an ideal solution towards ensuring sustainable urbanization for people and planet. It is imperative to implement this agenda for biodiversity conservation, One Health and climate mitigation.

⁶⁵ Conservation International., 'Our Blue Carbon Program' Available at <https://www.conservation.org/projects/our-blue-carbon-program> (Accessed on 16/04/2026)

⁶⁶ African Development Bank Group., 'Urbanization in Africa' Op Cit

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