KeSEBAE NEWS

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Nairobi River Reclamation

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Once a symbol of life and vitality flowing through Kenya's capital, the Nairobi River is part of a larger basin comprising several tributaries, including the Mathare, Ngong, Gitathuru, Rui Ruaka, and Kirichwa Rivers. Spanning over 70 kilometers in length, the Nairobi River Basin drains an area of approximately 2,000 hectares, traversing key sub-counties such as Westlands, Starehe, Kamukunji, Kasarani, Embakasi, and parts of Dagoretti and Lang'ata. Historically, this intricate river network served as a natural drainage and ecological corridor, supporting peri-urban agriculture, early industrial activity, and biodiversity within Nairobi's rapidly evolving urban landscape. However, over the years, this once thriving river system has morphed into a corridor of pollution, neglect, and unregulated urban sprawl. The Nairobi River and its tributaries have borne the brunt of rapid urbanization and weak enforcement of environmental regulations. Key drivers of its degradation include the direct discharge of industrial effluent, untreated domestic sewage from informal settlements, indiscriminate dumping of solid waste along riverbanks, and encroachment on riparian zones by illegal developments. These challenges have not only compromised water quality and aquatic biodiversity but have also amplified urban flooding risks and exposed surrounding communities to serious health hazards.

DEAR READER

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A monthly Newsletter touching on topical issues affecting our environment.

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The Nairobi River became severely degraded by decades of unplanned growth. Early warnings date back over a century: in 1913 a visiting engineer, Price Williams, formally protested that raw sewage from Nairobi was being dumped untreated into the river. By the late 20th century the problem was obvious: pollution from informal settlements, industry and solid waste had turned stretches of the river into open sewers.

A community activist later described Nairobi's once- "cool waters" as "murky and turbid", noting that past clean up attempts had repeatedly failed. In short, by the 1990s civic leaders and environmentalists recognized the urgent need to rehabilitate the river basin, prompting coordinated projects and clean up campaigns involving national government, city authorities, donors, NGOs and local communities.

This 2005 Photo Shows the Nairobi River Choked with Garbage Under a Footbridge

Major Reclamation Projects

From about **1999** onward, Nairobi's water agencies and development partners launched a series of multi-year river rehabilitation programs. For example, the Kenyan government, through the Office of the Prime Minister, the Ministry of Environment, and the United Nations Environment Programme (UNEP), inaugurated the Nairobi River Basin Rehabilitation Programme. The phases and their respective focus areas are outlined below:

1. Phase I (**1999– 2001**): Assessing water quality, removing debris, and raising public awareness.
2. Phase II (**2001– 2003**): Extending pollution monitoring and community education to tributaries, including the Mathare and Ngong Rivers.
3. Phase III (**2004– 2008**): Broadening the scope to ecosystem restoration, including replanting, riverbank beautification, and demonstration of "clean" stretches, with support from multiple ministries.
4. Phase IV (**2016**): Aimed at changing institutional and public attitudes toward waste disposal.

A World Bank report notes, however, that these four phases ultimately "did not result in success" – hindered by funding gaps, limited enforcement and poor community engagement. [1]

In parallel, from **2006– 2009** the Nairobi River Basin Programme (NRBP), a broad multi-stakeholder initiative, rehabilitated several rivers stretches. Overseen by the Prime Minister's office, NRBP involved 17 government agencies working with donors and civil society. It carried out riparian landscaping and
reforestation, aiming to stop illegal discharges and even relocate informal settlements out of the river buffer zone.

In **2007**, the Kenyan and UNEP teams conducted major dredging and trash clearing along the banks. These activities temporarily improved flow and quality, but heavy rains soon re-deposited garbage from streets into the channels, showing the limits of one-off clean ups.

[1] Earth5R. (2023). *Fighting for Communities Along Nairobi River*. Retrieved from https://earth5r.org/fighting-communities-nairobi-river/

The following are more initiatives undertaken since 2010:

1. **2011– 2014**: The African Development Bank implemented the Nairobi Rivers Sewerage Improvement Project, which funded significant sewage network upgrades across the city to reduce wastewater discharge into the rivers.

2. **2018**: The National Environment Management Authority (NEMA) intensified industry enforcement, issuing directives for factories to install effluent treatment plants or face closure.

3. **2019**: The UNEP–Rotary "Adopt-a-River" campaign was launched. Rotary Clubs in Nairobi partnered with UNEP to begin pilot clean up activities in informal settlements, engaging schools and local youth.

   - NEMA initiated the Urban Rivers Regeneration Program, targeting the rehabilitation of heavily polluted urban tributaries. This marked a more structured, government-led approach to restoring the rivers.

4. **2020**: Under Nairobi Metropolitan Services (NMS), the national government in collaboration with UN-Habitat launched the Nairobi River Regeneration Initiative. The program envisioned converting polluted rivers into public green spaces and corridors.

   - Nairobi City County introduced the "Kazi Mtaani" programme, which later integrated into the ClimateWorx CRSP, Climate Resilience Service Program. It mobilized tens of thousands of youth to clean drains, remove riverbank waste, and plant trees.

5. **December 2022**: Recognizing the limitations of earlier efforts, President, H.E Dr. William Ruto issued Gazette Notice No.14891 formally establishing the Nairobi Rivers Commission.

   The Commission's mandate, as outlined in law, includes:

   i. Coordinating all actors across the river basin.
   ii. Reviewing previous projects (2000 UNEP, 2019 UNEP-Rotary, 2020 UN-Habitat, etc.).
   iii. Developing a Nairobi Basin Regeneration Programme (NABREP).
   iv. Enforcing environmental compliance.
   v. Establishing a trust fund to support implementation.

6. **February 2023:** Nairobi gained international attention when it was featured by the United Nations Environment Programme (UNEP) as a case study in urban river restoration, highlighting the city's efforts to integrate environmental rehabilitation with sustainable development goals.

Key Stakeholders in Nairobi River Reclamation

Efforts to reclaim the Nairobi River have involved a diverse coalition of actors from government, civil society, the private sector, and international development partners. Below is a breakdown of key stakeholders and their contributions:

1. **Government Ministries and Agencies**

   Key national ministries involved include:

   - Ministry of Environment, providing policy leadership.

- Ministries of Water, Health, and Infrastructure, supporting water management and sanitation.

Supporting agencies include:

i. National Environment Management Authority (NEMA)
ii. Athi Water Services Board
iii. Nairobi City Water & Sewerage Company
iv. Nairobi City County
v. Nairobi Metropolitan Services (NMS)

These bodies have led policy formulation, enforcement, sewerage upgrades, and coordinated city-wide planning.

2. **Private Sector**

- Water and sanitation utilities have upgraded sewer systems.
- Manufacturers are increasingly subject to new environmental laws, including the Extended Producer Responsibility (EPR) framework that came into effect in 2023.
- In August 2023, packaging industry associations partnered with NEMA to remove plastic waste from rivers.[2]

3. **Multilateral and Bilateral Development Partners**

- UNEP and UN-Habitat have been central to strategic planning and convening stakeholders.
- African Development Bank (AfDB) and World Bank have funded major sewerage and urban infrastructure projects.
- JICA (Japan International Cooperation Agency) has supported technical and financial capacity-building in the water and sanitation sector.

4. **Civil Society and NGOs**

- Local NGOs and community-based organizations (CBOs) have been instrumental in mobilizing youth and women along tributaries like Mathare, Ngong, and Kariobangi.
- In Korogocho slum, the youth-led Komb Green Solutions has cleared tonnes of waste and transformed a former dump site into a community riparian park.

5. **Rotary Clubs and Community Volunteers**

- Rotary clubs such as the Lavington Eco Club have organized school clean-up drives, sanitation education, and community engagement projects in places like Kawangware.
- One such Rotary pilot initiative was highlighted by the UN Deputy Secretary-General during a high-profile 2022 site visit.

6. **Civil Society Platforms and Advocacy Groups**

- The Nairobi Rivers Association and the Nairobi River Basin Trust (formerly Kenya Water for Health Organisation) have led public awareness campaigns, river health monitoring, and policy advocacy to maintain long-term public attention and accountability.

[2] Basel Convention. (2023). *Kenya: Plastic Waste Reduction Partnership with Packaging Industry and NEMA.* Retrieved from https://www.basel.int

A Restored Riparian Stretch of the Nairobi River (with footbridge), June 2023

Challenges Facing the Nairobi River Reclamation Initiative

Despite numerous well-meaning efforts, reclaiming the Nairobi River has faced deep-rooted and recurring challenges that have hindered long-term success. Many early initiatives, including phases of the Nairobi River Basin Program (NRBP), stalled due to chronic budget shortfalls and unclear leadership structures. Gains from clean up efforts such as dredging and tree planting were often reversed by seasonal floods, which washed garbage and debris back into the channels, highlighting the

limits of one-off interventions and the lack of an integrated drainage solution. Encroachment on riparian zones has also been a major obstacle; while relocation of informal settlements was part of initial strategies, it was met with resistance due to Nairobi's persistent housing shortages and the vulnerability of slum dwellers.

Furthermore, most riverside communities continue to lack basic services such as toilets and piped drainage, leading to continued dumping of domestic waste directly into the river even after clean-up campaigns. Weak enforcement and governance lapses have further undermined progress. Reviews of past projects have pointed out that pollution levels were sometimes underreported, and institutional support to enforce environmental regulations was insufficient.

Compounding these issues is the limited grassroots involvement, many communities have remained excluded from planning processes, weakening their sense of ownership and responsibility. In sum, the Nairobi River's restoration has been constrained by a combination of funding constraints, political shifts, poor infrastructure, and insufficient community engagement.

Key Strategies for Reclamation

To ensure the Nairobi River Reclamation effort succeeds sustainably, the following integrated strategies have been identified:

1. **Waste Management Reforms**

   - Establishment of efficient solid waste collection systems, particularly in informal settlements.
   - Expansion and upgrading of sewage treatment infrastructure to prevent direct discharge into the river system.

2. **Riparian Zone Protection**

   - Strict enforcement of the 30-meter riparian buffer regulation to deter encroachment and safeguard biodiversity.
   - Relocation of illegal settlements on riverbanks, accompanied by adequate provision of humane and affordable housing alternatives.

3. **Public Awareness and Education**

   - Institutionalizing environmental education in schools and communities to foster stewardship from a young age.
   - Empowering citizen action through community clean ups, environmental clubs, and information campaigns.

4. **Tree Planting and Greening**

- Restoration of native vegetation along riverbanks to improve water quality, stabilize soil, and promote ecological balance.
- Promotion of urban greening as both an environmental and social amenity.

5. **Policy and Governance**

- Strengthening coordination among lead agencies like NEMA, WARMA, Nairobi County, and Nairobi Rivers Commission.
- Updating environmental laws and ensuring consistent enforcement across all sub-counties and jurisdictions.

Today, the Nairobi River reclamation strategy is shaped by lessons from past attempts and is driven by a whole-of-society approach. At the center of this renewed momentum is the Nairobi Rivers Commission, established via Gazette Notice in December 2022, and tasked with coordinating efforts across national and county governments, civil society, academia, and the private sector. The Commission envisions reviving the river network as part of Nairobi's "blue-green infrastructure", unlocking ecological, recreational, and economic value.

Among its mandates are reviewing past plans to extract best practices, crafting a basin-wide Nairobi Basin Regeneration Programme (NABREP), and establishing a dedicated trust fund to finance restoration. At the same time, enforcement is gaining traction. The 2022 Waste Management Act granted new legal powers to regulators. In early 2024, NEMA invoked the law's Extended Producer Responsibility (EPR) clause for the first time, ordering 29 identified companies to clean waste-clogged riversides within 30 days; recognizing their packaging as a key driver of both pollution and urban flooding.

On the ground, clean up and employment programs continue to play a vital role. The Kazi Mtaani initiative, for instance, mobilized over 40,000 youths between 2020 and 2022 to clear drains, collect waste, and rehabilitate riverbanks. International partners remain actively involved: UN-Habitat is supporting slum upgrading and riverfront planning as part of the 2020– 2024 Nairobi River Regeneration Initiative, aligned with the new Commission's framework.

The World Bank and African Development Bank (AfDB) are funding sewer network expansions and flood control infrastructure. Additionally, donor-backed wetland and awareness projects continue, such as UNEP's Asia-Pacific Wetlands program launched in 2023 with Nairobi as a beneficiary. Strategically, the outlook favors integrated planning, combining sewer upgrades, solid waste management, and sustainable land use.

New master plans include enforcement of 30-meter riparian buffers and wetland protections. The creation of a riverfront promenade in Karura and planned parks at Dandora dumpsite reflect a growing commitment to using green public spaces to shield waterways. If successfully implemented, the NABREP and trust fund model could finally transition Nairobi River cleanup from episodic effort to enduring urban infrastructure.

Examples of Progress in Nairobi River Reclamation

There are already signs of local success. They include:

i. Korogocho – Komb Green Solutions

Youth-led community group transformed an illegal dumpsite along the river into People's Park, with vegetable gardens and a memorial for babies recovered from the river.[3]

Komb Green Solutions Before and After Reclamation

i. Mathare and Other Informal Settlements

Regular clean-up days organized by local groups have removed hundreds of tons of waste from riverbanks. School clubs now participate in water quality monitoring.

ii. Bank Stabilization Efforts

Youth groups and environmental clubs have planted bamboo and vetiver grass along eroded riverbanks to reduce runoff and promote soil retention.

iii. Michuki Memorial Park (Central Nairobi)

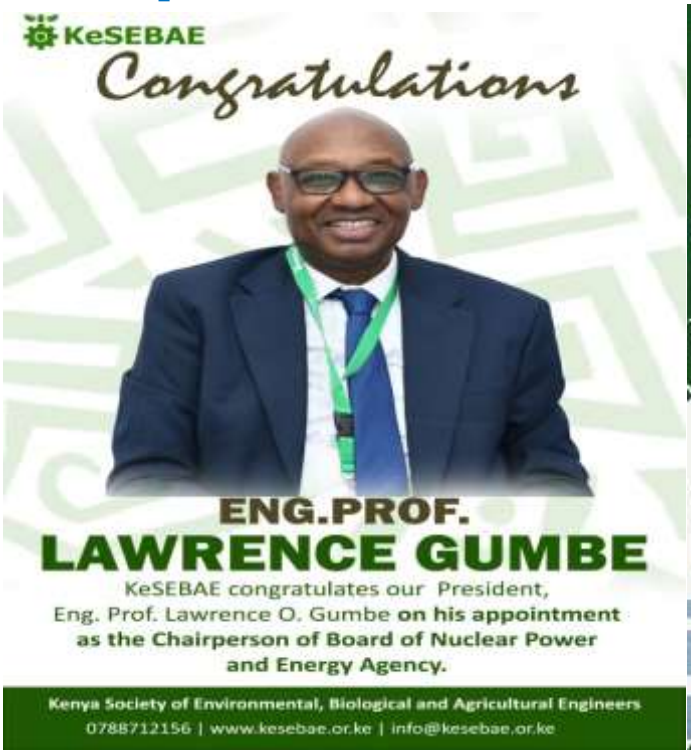
Once a neglected, insecure thicket, this park was rehabilitated in 2020 through efforts by the Ministry of Environment, NEMA, and Kenya Forest Service. It now serves as a safe, green public space and a model for riverfront regeneration.

[3] Regreening Africa. (2023). *Youth Transform Nairobi's Riverbanks through Community Greening Initiatives.* Retrieved from https://regreeningafrica.org

Michuki Memorial Park Before and After Rehabilitation

The Nairobi River Reclamation effort illustrates the complexity of restoring urban water systems amid rapid growth, weak infrastructure, and socio-political constraints. While past interventions faltered due to fragmented planning and enforcement gaps, the current integrated approach, anchored by the Nairobi Rivers Commission and supported by enhanced legal tools such as the Waste Management Act and EPR framework, marks a pivotal shift toward coordinated, multisectoral action. Long-term success will depend on consistent investment in sewer and waste infrastructure, enforcement of riparian protection, and inclusive community engagement. For engineering professionals, this presents a compelling case for applying systems thinking, resilient design, and stakeholder-driven implementation in the rehabilitation of degraded urban ecosystems.

Latest Updates



Eng. Prof. Gumbe was appointed as the Chairperson of NuPEA

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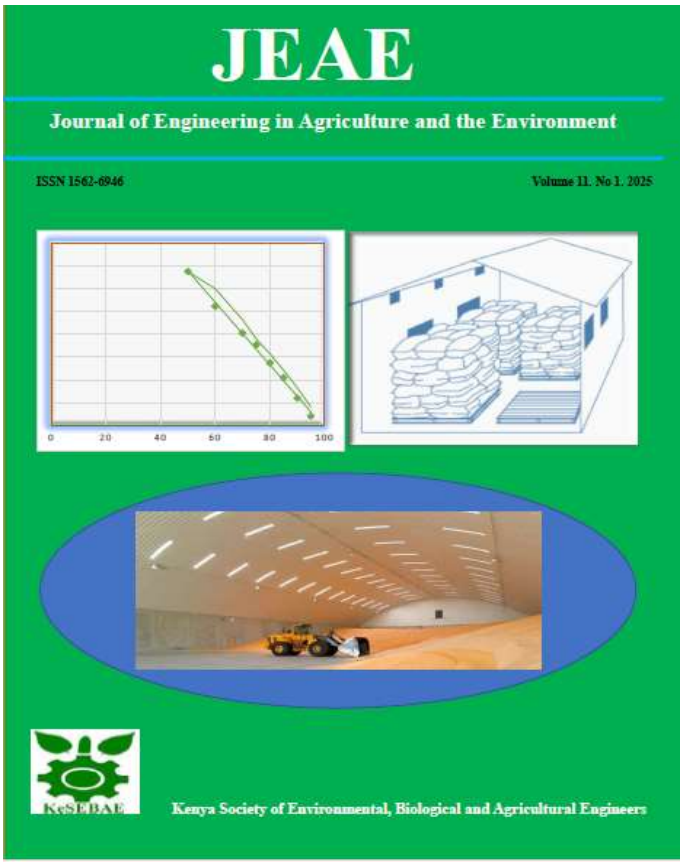

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Papers featured in the issue are:

i. ***A Review of Solar-Powered Irrigation Systems (SPIS).***

ii. ***Optimizing Use of Hydrogen Peroxide and Ultraviolet Irradiation to Improve Wastewater Quality from Wet Coffee Processing.***

iii. ***Evaluating Waste Management Practices in the Context of Climate Change Adaption and Mitigation in Africa.***

iv. ***Analysis of Engineering Solutions in Grain Storage.***

v. ***Investigation of Performance of Bioethanol Cooking Fuel at Different Ethanol Concentration Levels.***

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JEAE

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c. Have not been previously published elsewhere, or, if previously published are supported by a copyright permission
d. Deals with theoretical, practical and adoptable innovations applicable to engineering and technology in agriculture, the environment and biological systems
e. Have a 150 to250 words abstract, preceding the main body of the article
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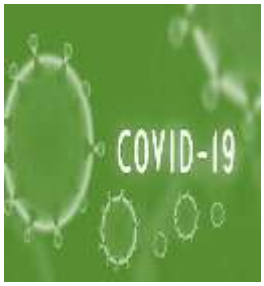

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