Leiden-Delft-Erasmus East Africa Research Network

KNOWLEDGE PRODUCTS

Issue No. 26/ November 2026

Urban Waste Management and the Protection of Mathare River Riparian Zones

COMMUNITY BRIEF



Urban Waste Management and the Protection of Mathare River Riparian Zones

Mwaura, S.W, Wamuchiru, E.W and Muketha, S.M

Key Messages

- Indiscriminate dumping of solid waste and untreated sewage is turning sections of the Mathare River into a moving sewer, destroying vegetation, increasing flood risk, and harming community health.
- About 54% of residents in some areas dispose of solid waste directly into the river, and over 55% discharge wastewater into it, largely because collection services are irregular or absent.
- Food, garden and organic waste each account for 14.70% of reported waste types, showing strong potential for composting and recovery.
- Current practices rely heavily on community efforts: recycling (26.72%) and clean-ups (25.00%) are more common than formal collection services (11.21%).
- Residents prioritise improved waste collection, awareness creation, recycling facilities, drainage repair and sanitation as the most important strategies for protecting the river.
- Conflicting laws on riparian buffer widths (ranging from 2 m to 30 m) and weak enforcement allow buildings and waste to encroach right up to the riverbanks.
- Community-led circular economy actions, reliable waste collection, clear buffer enforcement, and coordinated action by county, national agencies, and residents can reverse the damage.
- Protecting the river supports cleaner water, reduced flooding, better health, and aligns with Kenya's Vision 2030 and the Sustainable Development Goals.

Context

The Mathare River and its tributary, the Gitathuru, flow through densely populated informal settlements in north-eastern Nairobi (parts of Mabatini, Mlango Kubwa, Airbase, and Hospital wards). These rivers are meant to act as natural filters, reduce flooding, support biodiversity, and improve the quality of life for nearby residents.

Instead, the river corridors have become major dumping grounds. Household waste, plastics, construction debris, and raw sewage regularly enter the water. Studies show that more than half of residents in some Mathare neighbourhoods dump waste or wastewater directly into the river because formal collection is limited, skips overflow, or are too far away. Encroachment by structures within the legal 30-metre buffer further reduces the river's ability to function.

The result is loss of vegetation, blocked channels, higher flood risk during rains, foul smells, mosquito breeding, and waterborne diseases such as diarrhoea, cholera, and typhoid. Conflicting national laws (Survey Act, Water Act, EMCA, Agriculture Act) create confusion over exact buffer widths, while enforcement remains weak. Past community efforts to keep the reserve clear have sometimes been disrupted by insecurity and competing land pressures.

Approach and Results

This study examined how everyday waste practices affect the Mathare River riparian zones. It combined household surveys (100 respondents along the Mathare and Gitathuru corridors), key informant interviews with NEMA, Nairobi City Water and Sewerage Company, Nairobi River Commission, county officers, waste collectors, and community groups, field observation, photography, and spatial mapping.

Key findings drawn from field observations, resident reports, and supporting literature include:

1. Waste is dominated by household refuse, plastics, and untreated sewage. Dumping is frequent (daily or weekly in many places) and often covers large stretches of the riverbank.

2. Women/wives were identified as the main household members responsible for waste management in 52.22% of responses. Men/husbands accounted for 24.44% and children for 23.33%. Degradation is spatially concentrated in the densest settlements. Waste spreads from the bank outward, blocking channels and contributing to erosion and vegetation loss.
3. Only 22% of households reported separating waste; 78% did not. Spatial variation was marked: Village 4B recorded the highest rate (9%), followed by Gitathuru (7%) and Village 3C (6%). Separation was virtually absent in Village 2, Village 3A and Village 3B, and very low in Kosovo (1%).
4. Current management practices are mostly linear and reactive. Formal collection is irregular; open burning and open dumping remain common; source separation is rare; and informal waste pickers recover materials with little official support.
5. Recycling was the most frequently reported practice (26.72%), followed by community clean-up activities (25.00%) and environmental awareness programmes (19.83%). Composting accounted for 13.79%, while formal waste-collection services were reported by only 11.21%. A small share (3.45%) reported no engagement in the listed practices.
6. Stakeholders recognise the problem. Residents show high awareness of health and environmental risks, yet convenient (but harmful) practices persist when services are absent. Coordination between county agencies, national bodies, private collectors, and communities is fragmented.
7. Respondents ranked improved waste collection highest (15.73%), followed by awareness creation (15.09%), provision of recycling grounds (14.44%), drainage cleaning and repair (14.22%), and sanitation facilities (14.01%). Resettlement from the riparian zone scored 13.15%, environmental monitoring 9.48%, and support for community waste initiatives only 3.88%. Residents clearly prioritise reliable services, infrastructure and awareness over purely community-driven solutions, while still recognising the need for local participation.
8. International examples (Suzhou Creek in Shanghai and the Beautifying Sheger Project in Addis Ababa) demonstrate that political commitment, interceptor sewers, green infrastructure, community involvement, and clear buffer enforcement can restore heavily degraded urban rivers.

Policy Recommendations

Short-term (0–12 months)

- Expand regular, affordable waste-collection routes and place additional skips or bins within easy reach of river-adjacent households, prioritising areas with the lowest separation rates.
- Design awareness and training programmes that specifically target women (the primary managers of household waste) while actively involving men and children to promote shared responsibility.
- Support and scale existing community recycling and clean-up activities, linking them to formal markets and providing basic equipment for waste pickers.
- Launch targeted source-separation pilots in higher-performing areas (Village 4B, Gitathuru, Village 3C) and extend lessons to low-separation villages.
- Conduct rapid drainage cleaning and minor repairs in known flooding and dumping hotspots.
- Establish a simple multi-stakeholder coordination platform (county environment department, NEMA, Nairobi River Commission, local chiefs, women's groups, CBOs and private collectors) that meets regularly to track progress.

Medium and Long-term (1–5+ years)

- Develop an integrated waste-management system that strengthens formal collection while building on existing community recycling and clean-up practices.
- Establish accessible recycling grounds and composting facilities to capture the large organic, paper and plastic fractions identified in the study.
- Improve sanitation infrastructure to reduce liquid and sanitary waste entering the river.
- Harmonise and consistently enforce riparian buffer regulations, combining clear demarcation with support for alternative livelihoods where resettlement is necessary.

- Integrate continuous environmental monitoring (waste hotspots, water quality and vegetation cover) into county planning and the wider Nairobi Rivers regeneration programme.
- Align all interventions with Kenya Vision 2030, the National Land Use Policy, EMCA, the Water Act and relevant SDGs so that funding and political support remain sustained.
- Protecting the Mathare River requires reliable services, recognition of women's central role in household waste management, expansion of source separation and recycling, and coordinated action between communities, county government and national agencies. The data show both the scale of the challenge and clear entry points for practical, community-supported solutions.

Acknowledgements

I give profound thanks to the Almighty God for the strength, provision, and grace that sustained me throughout this work, from the start of the journey in September 2025 to its completion. I am deeply grateful to my family for their unwavering material and spiritual support. Special appreciation goes to my supervisors, Dr. Elizabeth K. Wamuchiru and Dr. Silas M. Muketha, whose insightful guidance, constructive feedback, and continuous encouragement greatly improved the quality of this research. I thank the Nuvoni Centre for Innovation Research and the LEARN Network for mentorship, financial support, and valuable intellectual contributions. I am particularly indebted to Dr. Musyimi Mbathi for shaping the direction of this study with his ideas and insights at Nuvoni. My sincere thanks also go to Bosibori Barake, Stephen Nyagaya, and Diana Mwau for the time and guidance they generously offered during the research process. Finally, I dedicate this work to the people of Mathare and the wider Kenyan public, with the hope that it contributes meaningfully to cleaner urban environments and the protection of riparian zones in informal settlements.

References

Anokye, K., Mohammed, S. A., Agyemang, P., Agya, A. B., Yahans Amuah, E. E., Sodoke, S., & Diderutua, E. K. (2024). From perception to action: Waste management challenges in Kassena Nankana East Municipality. Heliyon, 10(14), e32438. https://doi.org/10.1016/j.heliyon.2024.e32438

Kaza, S., Yao, L. C., Bhada-Tata, P., & Van Woerden, F. (2018). What a Waste 2.0: A global snapshot of solid waste management to 2050. World Bank. http://hdl.handle.net/10986/30317

Muketha, S. M. (2014). Riparian zone conservation in a changing urban land use environment: A case of Nairobi River Basin, Kenya (Unpublished PhD thesis). University of Nairobi.

United Nations Environment Programme. (2024). Global waste management outlook 2024: Beyond an age of waste – Turning rubbish into a resource. UNEP. https://wedocs.unep.org/20.500.11822/44939

Karisa, C. (2010). A negotiated framework for rehabilitation of riparian zones in Nairobi. ISOCARP. https://www.isocarp.net/Data/case_studies/1780.pdf

African Development Bank Group. (2021). Addis Ababa "Beautifying Sheger" River Development Project: Investment strategy and infrastructure plan. African Development Bank Group.