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Urban River Ecosystems; An Evaluation of the Proposed Restorative model for River Sosiani, Eldoret City

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Urban river degradation resulting from rapid urbanization constitutes an acute sustainability challenge, exemplified by the Sosiani River in Eldoret—a once vibrant ecological corridor in early 1900s but now facing pollution, wetland encroachment (67% loss since 2005), and plummeting biodiversity. As Eldoret expands by 4.3% annually being the only city in Kenya's North Rift, the strain on urban ecosystems is expected to increase proportionately. The research proposes an integrated restoration framework that combines ecological science, intelligent technologies, and deliberate institutional reforms. Taking a cue from success stories like Cheonggyecheon (Seoul) and Singapore River, the framework employs geospatial mapping, hydrology modeling, and institutional diagnostics to determine root causes. Institutional problems—poor enforcement of the Water Act (2016) and fragmented urban governance—account for 68% of the ecosystem loss, study says. Failure to implement it will result in the loss of 40% of the remaining wetlands by 2045.The "modern urban river" plan employs optimized wastewater infrastructure, IoT water quality sensors, and blue-green infrastructure (i.e., bioswales, constructed wetlands) to build resilience. A County investment of KES 1.5 billion, out of which KES 500 million has been dedicated to fencing and restoring of the wetlands would decrease pollutants by 55%, lower flood risk by 40%, and yield a 9.2% per annum return on investment through eco-tourism, health savings, and disaster avoidance. The dream Sosiani River Restoration Authority (SRRA) would be grounded on enforcement, coordination, and adaptive governance. Grounded on Kenya's Climate Change Act (2016), SDGs 6, 11, and 15, and the Ramsar Convention, this dream substitutes Sosiani as a socio-ecological asset that offers a replicable model for resilient urban futures in Africa.

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