

Graduation Plan

Master of Science in Architecture, Urbanism & Building Sciences

MSc Landscape Architecture 2024 - 2025

[Zhuoran Chen]



Graduation Plan

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), your mentors and delegate of the Board of Examiners one week before the P2 date at the latest.

I Personal information

Full name	Zhuoran Chen
Student number	5997089

II Studio / Lab information

Name / Theme	Urban Ecology	
Main mentor	Nico Tillie	Landscape Architecture
Second mentor	Mo Smit	Architecture
Argumentation of choice of the LA graduation lab	The Urban Ecology Lab provides a framework that aligns perfectly with this project's goals of integrating ecological and social systems into urban design. The lab's focus on urban sustainability, biodiversity, and nature-based solutions resonates with my interest in using landscape architecture to address waste management and foster community cohesion in informal settlements. The lab encourages interdisciplinary research, offering a platform to explore innovative, scalable solutions for Nakuru while drawing from broader ecological theories and practices.	

III Graduation project

Title of the project	RHYTHM OF RESILIENCE- Designing adaptive landscapes in Nakuru’s informal settlements that harmonize ecological restoration and community cohesion.	
Context and aim of the project		
Location (region / area / site)	Nakuru, Kenya	
Problem statement	Nakuru, once celebrated as East Africa's cleanest city, faces significant challenges stemming from rapid urbanization, environmental degradation, and socio-economic inequality. Informal settlements, which constitute a substantial part of Nakuru’s urban fabric, lack adequate waste management systems, public spaces, and social cohesion mechanisms. These deficits exacerbate urban fragmentation and hinder the city’s sustainability. Modular landscape interventions offer a promising approach to addressing these challenges by integrating ecological, social, and cultural elements to create scalable and adaptable solutions.	

Research question(s)	Main Question: How can modular landscape interventions address waste management and promote social cohesion in Nakuru's informal settlements? Sub-Questions: 1. What are the current challenges and opportunities related to waste management in Nakuru's informal settlements? 2. How can modular landscape design enhance public spaces and foster community interaction in these settlements? 3. What ecological strategies can be integrated into modular interventions to ensure sustainability and scalability across Nakuru?
Design assignment	Citywide Scale Analyze Nakuru's informal settlements to understand the systemic challenges of waste management, including inefficiencies in collection, pollution hotspots, and impacts on public health. Develop a citywide strategy that integrates modular landscape interventions, green corridors, and decentralized waste management nodes. This strategy will link ecological restoration efforts with Nakuru's broader urban systems, supporting both environmental sustainability and social cohesion. Neighborhood Scale Investigate the specific interactions between waste management practices and residential life in Nakuru's informal settlements. Focus on neighborhoods located near rivers or waste dumping sites. Propose localized solutions such as modular public spaces, community composting stations, and waste-to-resource facilities. These interventions will aim to reduce pollution, improve health outcomes, and foster resident engagement in sustainable practices. Site-Specific Scale Target critical waste hotspots, such as informal dumping grounds or degraded riverbanks, to implement detailed design solutions. Develop constructed wetlands for water purification, vegetative buffers to prevent further pollution, and multifunctional community spaces for waste processing and education. These site-specific interventions will serve as prototypes that enhance biodiversity and demonstrate effective waste management in high-impact areas. Integration This multiscale assignment bridges systemic citywide strategies with neighborhood and site-specific solutions, creating a cohesive

	framework for transforming Nakuru into a sustainable, resilient, and socially inclusive city.
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IV Graduation process

Method description

M1:Conduct environmental impact assessments of waste generation, collection, and disposal practices within Nakuru’s informal settlements. Evaluate the effects of these practices on air, soil, and water quality, particularly around identified dumping sites and their proximity to residential areas. Collaborate with local environmental agencies to collect data and analyze pollution levels.

M2:Perform case study research on modular landscape interventions in comparable developing cities. Investigate their impact on waste management and social cohesion. Conduct interviews with practitioners, urban ecologists, and community leaders to gather insights on adaptable strategies for Nakuru's context.

M3:Engage with residents, community groups, and local businesses in Nakuru’s informal settlements through focus groups and interviews. Explore their perspectives on public spaces, waste management challenges, and social interaction needs. Analyze this qualitative data to uncover cultural, economic, and behavioral factors influencing waste disposal and community dynamics.

M4:Utilize GIS tools to map Nakuru’s informal settlements, waste disposal hotspots, and existing public spaces. Combine spatial analysis with site visits to identify key locations for potential landscape interventions. Develop and test modular design simulations that integrate waste processing, public space creation, and ecological restoration.

Literature and more applied references

Loeckx, A., Localising Agenda 21: Action Planning for Sustainable Urban Development (Program), & United Nations Human Settlements Programme. (2004). Urban trialogues: visions, projects, co-productions. UN-HABITAT.

Van Deutekom, I. J. (2010). Building in Nakuru: low-cost housing improvement for Nakuru Town (Kenya). [Unpublished work].

Duchhart, I. (2007). Designing sustainable landscapes: from experience to theory: a process of reflective learning from case-study projects in Kenya. [PhD Dissertation, Wageningen University]. <https://doi.org/10.18174/27196>

Siems, T. (2023). Imparting city: methods and tools for collaborative planning. Birkhäuser.

V Reflection on the project proposal

1. What is the relation between your graduation topic, the lab topic, and your master track?

My graduation topic focuses on designing modular landscapes to address ecological and social challenges in Nakuru's informal settlements. This aligns with the Urban Ecology Lab's emphasis on integrating natural systems and human dynamics in urban contexts. Furthermore, it reflects the core of the Landscape Architecture master track, which advocates for creating sustainable, adaptive landscapes that respond to environmental and social needs. By synthesizing ecological principles with community-oriented design, the project embodies the essence of both the lab and the discipline.

2. What is the relevance of your graduation work in the larger social, professional and scientific context?

This project addresses pressing social and environmental issues, contributing to broader global discourses on sustainable urbanization, particularly in the Global South. Professionally, it proposes practical, scalable solutions for integrating waste management and public space design in informal settlements, a critical area of interest for urban planners and landscape architects. Scientifically, it advances modular design as a strategy for addressing urban ecological challenges, potentially serving as a replicable model for other rapidly urbanizing cities in Africa and beyond.