

Navigating Urban Expansion:

Viable Options for Sustainable Cities in Tanzania

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List of abbreviations

AfDB	–	African Development Bank
CBD	–	Central business district
FGD	–	Focus group discussion
KII	–	Key informant interview
LGA	–	Local government authority
M&E	–	Monitoring and evaluation
NGO	–	Non-governmental organisation
NMT	–	Non-motorised transport
PO-RALG	–	President’s Office—Regional Administration and Local Government
PPP	–	Public-private partnership
SDG	–	Sustainable Development Goal
SGR	–	Standard gauge railway
TDV	–	Tanzania Development Vision
TANESCO	–	Tanzania Electric Supply Company
URT	–	United Republic of Tanzania

Abstract

Urban areas in Tanzania are growing rapidly, exerting significant pressure on housing, infrastructure, services and the environment and threatening the sustainability of the country's cities and towns. To address these challenges, this study examined the adequacy and effectiveness of current frameworks for the development of sustainable cities in Tanzania, with a focus on Dodoma, the national capital city. Guided by urban resilience and systems thinking theories, the research employed a cross-sectional case study design using a mixed methods approach. Data were collected from 482 randomly selected households across central business district (CBD), urban and peri-urban wards, supplemented by key informant interviews at national and local levels, and focus group discussions (FGDs). Quantitative data were descriptively analysed for frequencies and percentages while qualitative data were analysed thematically and by scoring and ranking. Findings indicate that Tanzania has established multiple frameworks relevant to urban sustainability, including national visions, policies, laws, regulations, plans, programmes and projects that align with international sustainability

agendas, such as the United Nations Sustainable Development Goals (SDGs). However, their implementation is constrained by lack of effective coordination among institutions, limited financial and human resources, inadequate awareness among implementers, conflicting priorities and lack of effective monitoring and evaluation mechanisms. The limited mandate of local government authorities and the absence of adequate implementation strategies are also affecting their effectiveness. These challenges have led to gaps in sustainable city outcomes, including low adoption of clean energy sources, inadequate affordable housing, poor waste management and weak non-motorised transport infrastructure. The study recommends establishment of a dedicated Urban Coordination Authority, review of outdated policies, and strengthened enforcement mechanisms, monitoring and evaluation plans and capacity building. Overall, the study underscores that while Tanzania has adopted robust frameworks for sustainable urban growth, their effectiveness requires improved governance, coordination and inclusive participation to achieve the goals of sustainable cities.

1 | Introduction

1.1 Background information

A sustainable city refers to a city that “is able to provide sustainable well-being for its inhabitants without reducing current and future urban ecosystem services under certain socio-economic conditions (Li 2024, p. 87).” Sustainable cities balance social, environmental, and economic dimensions to meet current and future needs without ecological harm (UN-Habitat 2016; OECD 2017; Li 2024, Ashinze et al. 2024; Zuniga-Teran et al. 2020). In this context, sustainable cities are viewed as drivers and products of social and economic development, as they ensure that urban growth is inclusive, resilient and future proof. Given their importance for development, Sustainable Cities and Communities is included as Goal 11 of the United Nations 2030 Agenda for Sustainable Development.¹

Available literature indicates that particular cities around the world are recognised as models for sustainability, including Copenhagen in Denmark, Amsterdam in The Netherlands, Stockholm in Sweden and Portland, Oregon, in the U.S.A. (Li 2024; Rostin et al. 2023; Kapse & Jangale 2024; Campbell 2018). Similarly, in Africa, several cities can be considered as examples of progress toward sustainability. They include Nairobi in Kenya, Kigali in Rwanda, Cairo in Egypt and Cape Town in South Africa (CORP 2022; Gibb 2007; Idowu 2022). These cities have developed and implemented various initiatives and policies that foster sustainable development (Agbetiloye 2024; Li 2024). Experiences from these cities indicate that adequacy of policy, institutional set-up, policy instruments, availability of resources and awareness among implementers are key factors for successful implementation (Li 2024; Cobbinah & Gaisie 2023;

Rostin et al. 2023). However, actual policies and practices vary between countries depending on the socio-economic setting of each country.

1.2 Research problem

Urban areas in Tanzania are growing at a rapid pace, with the urban population increasing from 29.6 percent in 2012 to 35 percent in 2022 (URT 2022a). This growth exerts significant pressure on housing, infrastructure, services and the environment, leading to challenges such as informal settlements, traffic congestion, inadequate waste management, limited adoption of clean energy, and environmental degradation (Miringay et al. 2024). These challenges threaten the attainment of sustainable cities, a goal recognised globally as essential for balancing environmental protection, economic growth and social equity (UN-Habitat 2016; OECD 2017).

Urbanisation challenges in Tanzania are growing despite the existence of national frameworks to guide the development of sustainable cities, including the National Environmental Policy (2021), the National Human Settlement Development Policy (2000) and the National Land Policy (2023). The Tanzania Development Vision 2050 (DIRA 2050) also recognises sustainable cities among the drivers of economic and social development. This disconnect between policy intentions and practical outcomes presents a critical problem that requires investigation.

In response, this research assessed the adequacy and effectiveness of frameworks to promote the development of sustainable cities in Tanzania. Specifically, the

research intended to answer the following research questions:

- Which institutions are responsible for the development of sustainable cities in Tanzania?
- To what extent are frameworks for urban planning effective in fostering the development of sustainable cities?
- What are the key challenges hindering effective implementation of frameworks for sustainable cities in Tanzania?
- What policies and strategies are required to promote sustainable urban growth?

1.3 Research objectives

The overall objective of the study was to provide policy options to the government for promoting sustainable cities in Tanzania. Specifically, the research aimed to:

- Examine the institutional set up for the development of sustainable cities in Tanzania.
- Assess the effectiveness of the urban planning frameworks to foster the development of sustainable cities.
- Identify key challenges that hinder effective implementation of frameworks for sustainable cities in Tanzania.
- Propose policy options and strategies that promote sustainable urban growth.



Photo credit: Shocks & Thold Tibajuka

¹SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable

2 | Theoretical and Conceptual Frameworks

2.1 Theoretical framework

This study was guided by two theories related to sustainable cities: Urban Resilience Theory and Systems Thinking Theory. Urban Resilience Theory (Holling 1973) requires that, for a city to be sustainable, it must have capacity to withstand, recover from, and adapt to shocks and stresses like natural disasters, climate change and economic downturns. The theory was used to assess if existing urban planning frameworks provide capacity for resilience to challenges of urbanization.

Systems Thinking Theory (Forrester 1969) is a framework for understanding how parts of a whole system are interconnected and influence each other, leading to a holistic view that reveals dynamic relationships and feedback loops. In this study, the theory helped researchers to view a sustainable

city as an interconnected system of sub-systems (social, economic and environment) and the need for coordination.

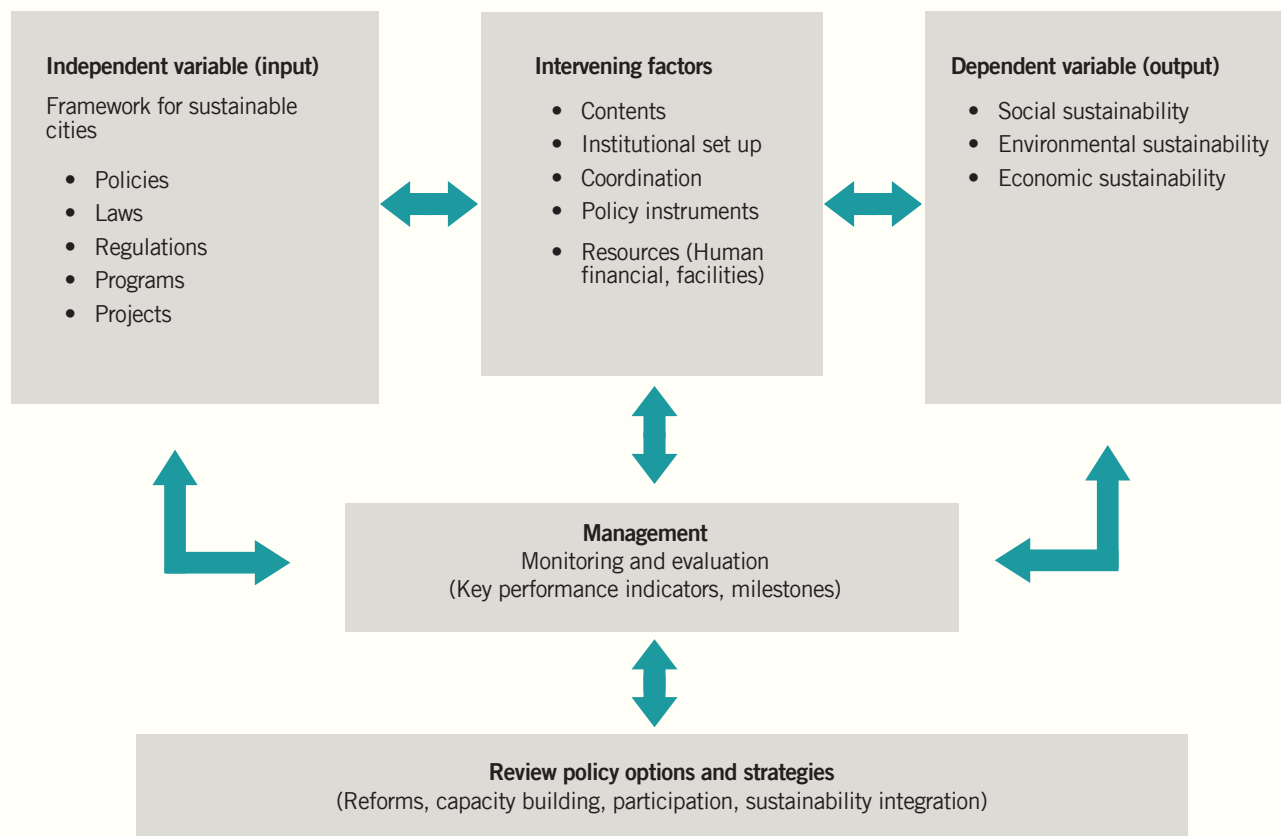
The two theories guided the researchers to define what a sustainable city should be and to assess the adequacy of the frameworks to promote the development of sustainable cities with interconnected systems and the capacity to overcome urbanisation challenges.

2.2 Conceptual framework

The conceptual framework (Figure 1) that guided this research considers a sustainable city as one that, under certain socio-economic conditions, is able to provide sustainable well-being for its inhabitants without diminishing the current and future services of the urban ecosystem.



FIGURE 1: CONCEPTUAL FRAMEWORK



The framework assumes that with adequate policy inputs and effective implementation at national and local levels, cities can be sustainable.

However, effective implementation of policies requires enablers, such as strong and coordinated institutions, policy instruments, financial resources, facilities, and adequate and knowledgeable human resources. The study assumes that adequate policies and their effective implementation will result in the development of sustainable cities, which are characterised by:

- Economic sustainability (local economy with green jobs, circular economy and effective use of resources).

In addition, the implementation of frameworks for sustainable cities requires a monitoring and evaluation (M&E) plan that includes key performance indicators and milestones at all stages to track progress and enable appropriate decisions. Results from the M&E plan provide feedback for ongoing review and improvement of the frameworks

- Social sustainability (inclusive, equitable, quality of life, social services);
- Environmental sustainability (reduced pollution, effective waste management, presence of open and green spaces, use of clean energy and reduced emissions); and

3 | Research Methodology

3.1 Study area

3.1.1 Selection of the research area

This research was conducted in Dodoma City, Tanzania. In addition to being Tanzania's capital city, Dodoma was purposely selected due to its rapid urbanisation, and the existence of strategies for the city's development. For these reasons, the findings and recommendations from this study can directly inform and enhance the current strategies and practices for the city's sustainability. Information on strategies and practices from other major Tanzanian cities, including Dar es Salaam, Arusha, Mbeya and Mwanza was also solicited to inform this study.

3.1.2 Description of the research area

Dodoma is located in the central part of Tanzania, serving as a strategic hub that connects the northern, southern, eastern and western zones of the country (Figure 2). According to Miringay et al. (2024), Dodoma has undergone seven hierarchal administrative changes from central province headquarters, Dodoma Regional Headquarters, Urban District Headquarters, Town, Municipality, City Council and finally national Capital city. Dodoma region has eight administrative districts including Dodoma City Council. Other districts councils are Chamwino, Mpwapwa, Kondoa District, Kondoa Town, Bahi, Kongwa and Chemba. Dodoma faces rapid urban growth, driven by the shift of government functions and population influx, such that, if not properly managed, the population increase will put pressure on infrastructure and social services (housing, water supply, sanitation, health and education), unemployment, traffic congestion and waste management. Hence, the need for sustainable urban planning to balance growth with environmental protection.

This study focused on Dodoma City Council due to its urbanisation challenges relative to other districts in the region. The study covered 16 of the 41 wards in Dodoma City. The wards were stratified into three categories: central business district (CBD), urban and

peri-urban (Figure 2). From each category, four to six wards were randomly selected for data collection. The actual number of wards for each category was proportion to the total number of wards.

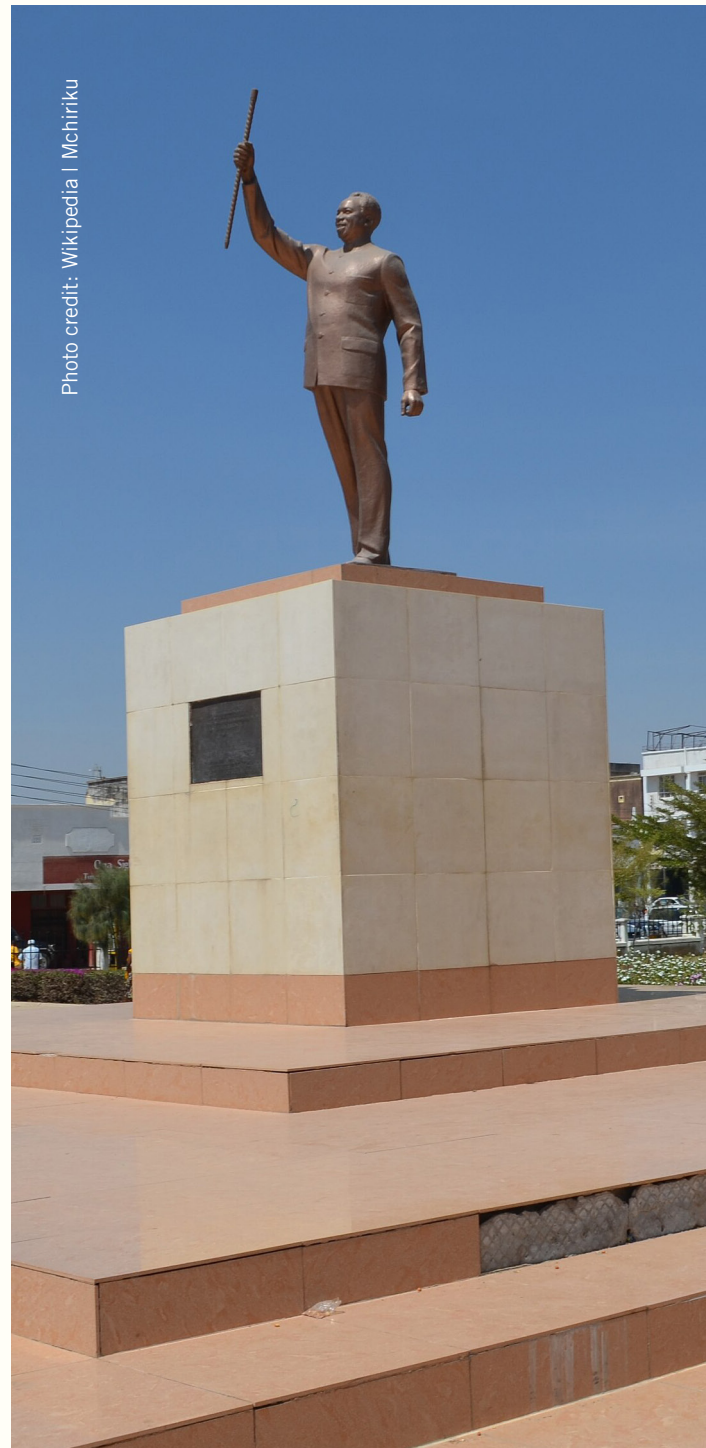
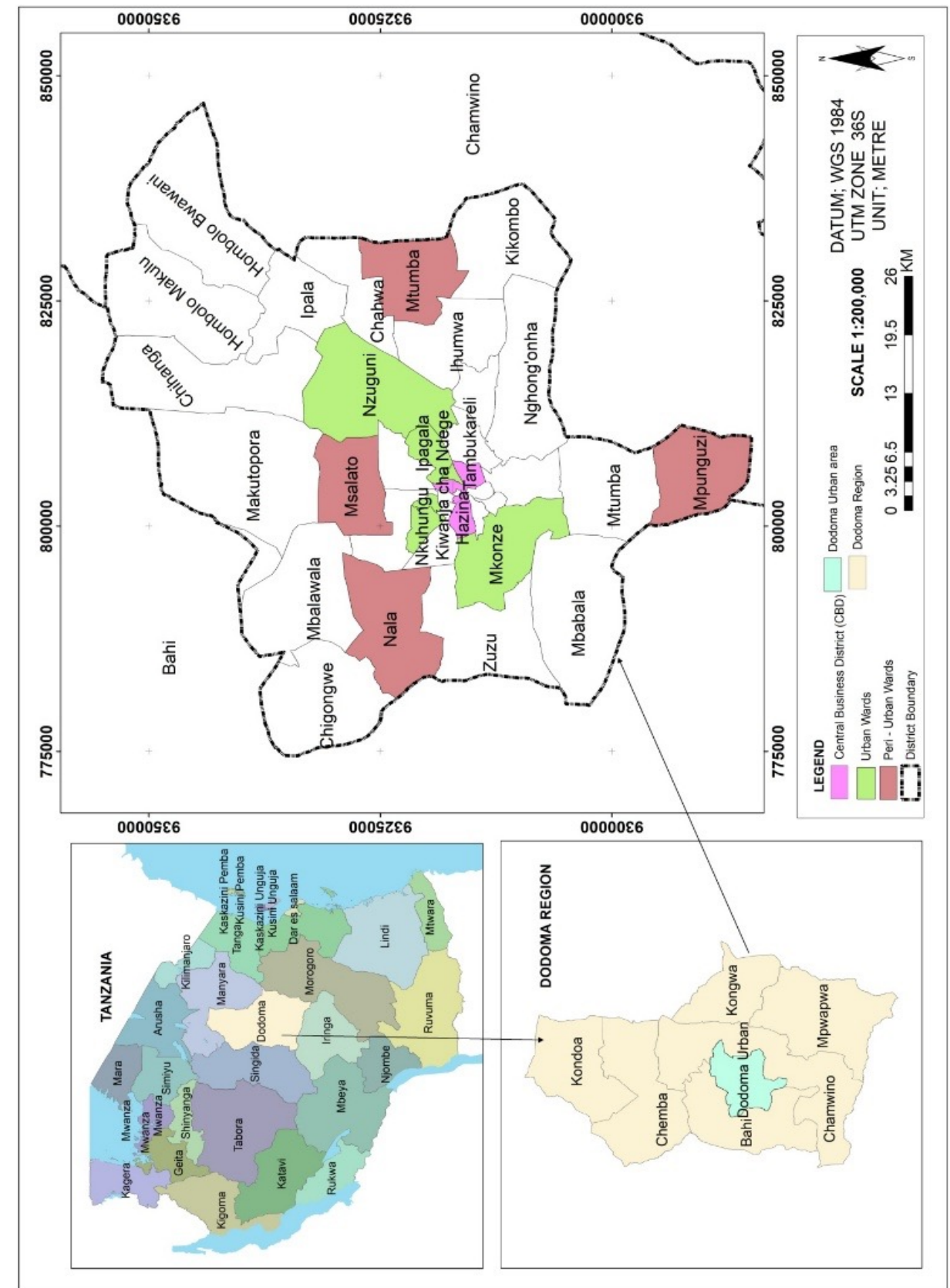


FIGURE 2: MAPS OF THE STUDY AREA



Source: Research team 2025

3.2 Research design and approach

A cross-sectional case study research design using a mixed methods approach was used (Bryman 2012; Creswell 2009). Quantitative methods were applied to investigate the status of urban services and the challenges for effective implementation of policies, laws and regulations related to the attainment of sustainable city.

Qualitative methods were used to examine what, how and why existing frameworks are not effective in order to understand factors and actors that facilitate or limit sustainability initiatives. The cross-sectional design was suitable for this research because of its ability to collect many variables and make inferences about a population of interest at one point in time (Morrosin 2024; Rubin & Babbie 2007; Berg 2009; Creswell 2009).

3.3 Sampling procedures and sample size

3.3.1 Sampling procedures

In each selected ward, three (3) streets (Kiswahili: mtaa) were randomly selected making a total of 48 mtaa involved in the study. From each street, 10 households were randomly selected from the household lists held by the respective ward/mtaa offices. The rationale for involving household respondents was that they are the target beneficiaries of the policies, laws and regulations related to city sustainability. Hence, households were relevant sources of information on the effectiveness of city policies, laws and regulations and challenges associated with their implementation. In addition, 22 key informants at national, district and city levels were purposefully selected based on their knowledge of urban planning and sustainable cities and interviewed for the study. They included representatives from central government ministries, local government authorities (LGAs), government authorities and agencies, universities and research institutions, non-government organisations (NGOs) and the private sector.

3.3.2 Sample size and distribution

Sample size for households was determined using Yamane formula (1967) as presented in Equation 1.

The Yamane formula was used because of its ability to provide a statistically valid, cost-effective and simple method for determining representative sample sizes when the population size is known (Israel 1992; Singh & Masuku 2014).

$$n = \frac{N}{1+N(e^2)} \dots\dots\dots (1)$$

where: N = population size (214,330), n = sample size and e = level of significance (0.05).

According to 2022 Population and Housing Census (URT 2022a), the total number of households in Dodoma City was 214,330 with a population of 765,179 people. Using the Yamane formula at 0.05 level of significance, the estimated sample size (n) was 482 households, with a 21 percent increase to compensate for non-responses and meet requirements for quantitative data analysis.

3.4 Data collection and analysis

3.4.1 Data collection

Data for this research were collected between April and June 2025. Both primary and secondary data collection methods were used. The methods included: a document review, key informant interviews (KIIs), focus group discussions (FGDs) and a survey questionnaire as described below.

Document review

The document review involved the selection and review of documents related to sustainable city frameworks at international and national levels. The documents were obtained from official websites and offices. The review established national and international frameworks that guide development of sustainable cities. A document review checklist was used to extract information from relevant documents.

Key informant interviews

Key informant interviews were conducted using an interview guide to collect data on the frameworks and institutional set-up for sustainable cities in Tanzania. In addition, researchers used this method to collect data on the current state of urbanisation in relation to

sustainable cities, challenges with existing frameworks and options to foster sustainable cities.

Focus group discussions

Three FGDs were held involving representatives of government ministries (Group 1), local government authorities (Group 2) and regulatory authorities (Group 3). The discussions were organised to collect general information on sustainable cities in Tanzania. Specifically, during the FGDs, members identified frameworks that guide development of sustainable cities in Tanzania, the weaknesses of existing frameworks and barriers that limit their effective implementation. During the discussions, participants also proposed policy options for sustainable cities in Tanzania.

Survey questionnaire

The survey questionnaire was administered to 482 representative households by the researchers with the assistance of 12 research assistants. The questionnaire included both open- and close-ended questions to allow flexibility and probing of responses. The questionnaire also used Likert scale questions to collect data on perceptions about sustainable city variables. The questionnaires were pre-tested and all research assistants were trained on data collection tools and conduct of the survey prior to the commencement of data collection. Data collected by the survey included socio-economic characteristics of respondents, their knowledge and practices on sustainable cities, frameworks and status of sustainable city indicators. They were also asked for their suggestions on policy options to foster sustainable cities.

3.4.2 Data analysis

Quantitative data were descriptively analysed for frequencies, means and percentages using the Statistical Package for Social Sciences (SPSS) computer software. Descriptive statistics provided the status and ranking of the assessed sustainable city

variables. Qualitative data were extracted from recording sheets and then clustered into themes and sub-themes and ranked according to priorities, weights or proportion of responses in a certain category. Data from the Likert scale questions were summarised for overall ranking using a weighted means as summarised in Equation 2 (Bowerman et al., 2011).

$$Mw = \frac{(\sum fi * wi)}{\sum fi} \dots\dots\dots (2)$$

Where: Mw = weighted mean for Likert scale data set on variable i, fi = Relative frequency of responses in percentage for variable i and wi = Value of variable i, in Likert scale.

3.5 Ethical considerations

All research ethical requirements were observed in conducting the study. These included obtaining research permits from relevant authorities at all levels, maintaining the confidentiality of participants, and ensuring that participation was voluntary.

4 | Results and Discussion

4.1 Existing institutions and frameworks for sustainable cities in Tanzania

4.1.1 Existing institutions

Results on the existing institutions responsible for sustainable cities in Tanzania are presented in Figure 3. The institutions identified by the study can be grouped into eight categories. Each category of institution and responsibilities is briefly described in the sub-sections below.

Central government ministries

These ministries provide policy direction, regulatory oversight and sectoral leadership. Key ministries include the President’s Office – Regional Administration and Local Government (PO-RALG), Ministry of Lands, Housing and Human Settlements Development, Ministry of Water, and Ministry of Energy. Others are Ministry of Community Development, Gender, Women and Special Groups, Ministry of Home Affairs, Ministry of Works, Ministry of Transportation, Ministry of Communications and Information Technology and Ministry of Natural Resources and Tourism.

Government authorities and agencies

These institutions are involved in implementation, monitoring and providing technical expertise. Key authorities and agencies include the National Environmental Management Council (NEMC), Tanzania Forest Services Agency (TFS), Tanzania Rural and Urban Roads Authority (TARURA) and Tanzania National Roads Agency (TANROADS). Others are Dodoma Urban Water Supply and Sanitation Authority (DUWASA) and the Tanzania Electric Supply Company (TANESCO).

Local government departments and sectors

These units manage urban services and implement sustainability policies at the local level. Key local government departments include education, agriculture, environment, community development, lands and urban planning.

Civil society and community stakeholders

Civil society institutions and local community stakeholders are central to participatory governance and grassroots-level implementation. They include community leaders and members, non-governmental organisations (NGOs) and civil society organisations (CSOs).

Development partners and international organisations

Development partners, such as World Bank, African Development Bank and UN-Habitat, provide financial support and international frameworks for sustainable cities.

Universities and research institutions

Universities and other higher learning institutions contribute to urban planning and development, research on urban governance, transport, and climate adaptation, innovation and technology for sustainable cities.

Private sector

Private sector institutions, such as construction firms, clean energy providers and financial institutions support the growth of sustainable cities by providing services.

Cross-cutting or overlapping institutions

Some entities, such as city councils and forest services, may operate across multiple sectors (urban planning, environment and public services) and at different levels.

FIGURE 3: EXISTING INSTITUTIONS FOR SUSTAINABLE CITIES IN TANZANIA

Institutional categories	Responsibility
Central government ministries	• Policy direction • Regulatory oversight • Sectoral leadership
Government authorities and agencies	• Implementation • Monitoring • Technical expertise
Development partners and international organizations	• Financial support • Global frameworks
Cross-cutting/Overlapping Institutions	Operation across multiple sectors/levels
Private sector	• Service provision • Investments • Clean energy • Finance
Universities and research institutions	• Research and innovation • Technology for sustainable cities
Local government departments and sectors	• Manage urban services • Implementation • Sustainability
Civil society and community stakeholders	• Participatory governance • Grassroots implementation

Source: Research team 2025

4.1.2 Frameworks for development of sustainable cities in Tanzania

Based on the literature review and field data, key frameworks to guide development of sustainable cities in Tanzania are presented in Table 1. These frameworks are categorised in hierarchical order as visions, policies, laws, regulations, plans, programmes and projects as hereunder described.

Visions and policies

Visions provide long-term direction and aspirations for urban development. They act as a guiding framework for aligning urban growth with sustainability principles. Visions are designed to inspire collective action by

government, private sector and communities to ensure that urbanisation responds to national priorities such as poverty reduction, economic growth and environmental protection. Released in 1999 by the Planning Commission, the Tanzania Development Vision (TDV) 2025 provided national direction until 2025. It has been now succeeded by TDV 2050, which was officially launched on 17 July 2025. TDV 2050 provides a long-term framework for Tanzania’s sustainable development until the year 2050 (URT 2025). TDV 2050 is anchored on three interrelated pillars; Pillar One (Strong Inclusive and Competitive Economy), Pillar Two (Human Capabilities and Social Development) and Pillar Three (Environmental Integrity and Climate Change Resilience). From these pillars, particularly the second and third, sustainable cities can

be viewed as among the operational pathways through which the TDV 2050 will be achieved. The goals of Pillar Two include: A Socially Protected and Inclusive Society (section 4.2.3) and Affordable Housing and Human Settlements (section 4.2.4). The goals of Pillar Three include: Pollution-Managed Environment (Section 4.3.3), Effective Land Management (Section 4.3.4) and Climate Change Resilience (Section 4.3.4). Therefore, sustainable cities are not just components of TDV 2050, but central to its success. As Tanzania continues to urbanise rapidly, the ability to plan and manage cities sustainably will determine whether the country achieves its long-term development goals.

Policies translate the national vision into sectoral and thematic strategies for sustainable cities. Key policies in Tanzania include the National Environmental Policy 2021, National Human Settlements Development Policy 2000 and the updated Tanzania National Land Policy 1995 (2023 edition). However, discussion with key informants indicated that some policies are not aligned with local needs while others have conflicting elements. A lack of coordination and limited resources to implement were also mentioned by respondents among key challenges.

Laws and regulations

Laws establish the legal basis for urban development and management. They provide enforceable mechanisms to ensure compliance with sustainability principles. In these ways, laws ensure the accountability, rights and responsibilities of urban actors. Results indicate that several laws have been developed to ensure implementation of the policies and strategies for sustainable cities. These laws include Urban Planning Act No. 8 (2007), Land Act No. 4 (1999), Environmental Management Act (2004), Land Use Planning Act (2007) and Local Government Urban Authority Act No. 8 (1982).

Regulations operationalise laws by providing specific procedures, standards and enforcement mechanisms ensuring clarity for investors, developers and citizens

²A key component of the East African Railway Master Plan by the East African Community and the Africa Integrated Railway Network Project by the African Union, the SGR will link the port of Dar es Salaam to the port of Mwanza in Tanzania through Morogoro, Makutupora (near Dodoma), Tabora and Isaka, with planned extensions to the neighbouring countries of Rwanda, Burundi and the Democratic Republic of the Congo (DRC). From Mwanza, the SGR will connect with ferry transport across Lake Victoria to Port Bell, near Uganda’s capital, Kampala. For further information, see <https://www.tanzaniainvest.com/sgr>

on what is permitted or prohibited. Results indicate the existence of several regulations, including the Urban Planning (Planning and Space Standards) Regulations (2018), Urban Planning (Use Groups and Use Classes) Regulations (2018), urban forest and waste management regulations (GN153: Forest Regulations; GN 263: Solid Waste Management Regulations). However, lack of enforcement of these laws and regulations was mentioned as a major challenge. Interviews with key informants revealed that poor enforcement of laws and regulations occurs as the results of low awareness among implementers, poor coordination among stakeholders, and weak institutional financial and human resource capacity.

Plans and programmes

Plans translate policies and laws into spatial and development blueprints. These include city specific master plans such as the Dodoma National Capital City Master Plan (2019-2039) (URT 2019). Programmes provide broad, coordinated interventions to implement plans and policies, ensuring continuity and scaling-up of sustainable practices across cities and towns. These include the National Programme for Land Use Planning, Surveying and Titling to tackle informal settlements, a common challenge in Tanzanian cities including Dodoma. However, lack of awareness among key stakeholders and limited resource capacity were identified as among the challenges for effective implementation of these programmes and strategies.

Projects

These are practical, localized interventions that directly address issues related to urban sustainability. Results from this study indicate the existence of several projects related to fostering sustainable cities, including the Standard Gauge Railway (SGR) Project.² In addition, area-specific projects, such as the Hombolo satellite, the Dodoma City Outer Ring Road and Fakwa Water Supply projects, seek to ensure that localised development aligns with broader goals to address critical urban needs of mobility, connectivity and access to services (AfDB 2023).

TABLE 1: FRAMEWORKS GUIDING THE DEVELOPMENT OF SUSTAINABLE CITIES IN TANZANIA

Goals / Visions	Policies	Laws	Regulations	Plans	Programmes/ Strategies	Projects
Tanzania Development Visions 2050	National Human Settlement Development Policy (2000)	Urban Planning Act No. 8 of 2007	Government Notice (GN) 91 Urban Planning (Use Groups and Use Classes)	Urban master plans	National Programme for Prevention and Regularisation of Unplanned Settlements	Land Tenure Improvement Project
Tanzania Development Vision 2025	National Land Policy 1995 (2023 version)	Land Act of 1995	GN 93 Urban Planning (Planning and Space standards).	Detailed planning schemes	National Programme for Land Use Planning, Surveying and Titling	Tanzania Cities Transforming Infrastructure and Competitiveness (TACTIC) (URT 2022b)
World Bank Urban Sustainability framework	National Environmental Policy 1997 (2021 version)	Land Use Planning Act 2007	GN 88 Urban Planning (Control and Management Public Open Spaces)	Urban greening plans	National Tree Planting Programme	Capital City Beautification project
Sustainable Development Goals	National Water Policy 2025	Environmental Management Act no. 20 of 2004	GN 90 Urban Planning (Urban Farming)	Redevelopment plans	National Climate Response Strategy 2012	Standard Gauge Railway (SGR)
UN-Habitat	National Energy Policy 2015	Village Land Act 1999	GN 102 Gravel (Removal) Regulations	Public transportation plans	National Waste Management Strategy	
	National Transport Policy 2003	Local Government Authorities Act 1982	GN 263 Environmental (Solid Waste Management) Regulations	Five-Year Development Plans 2021/2022 to 2025/2026.		
			GN 474 The Environmental Management Regulations			
			GN 92 Urban Planning (Zoning of Land Uses) Regulations			
			GN 153 Forest Regulations			

Source: Literature review 2025

4.2 Effectiveness of frameworks and institutions for sustainable cities

The effectiveness of the national frameworks for sustainable cities was analysed based on:

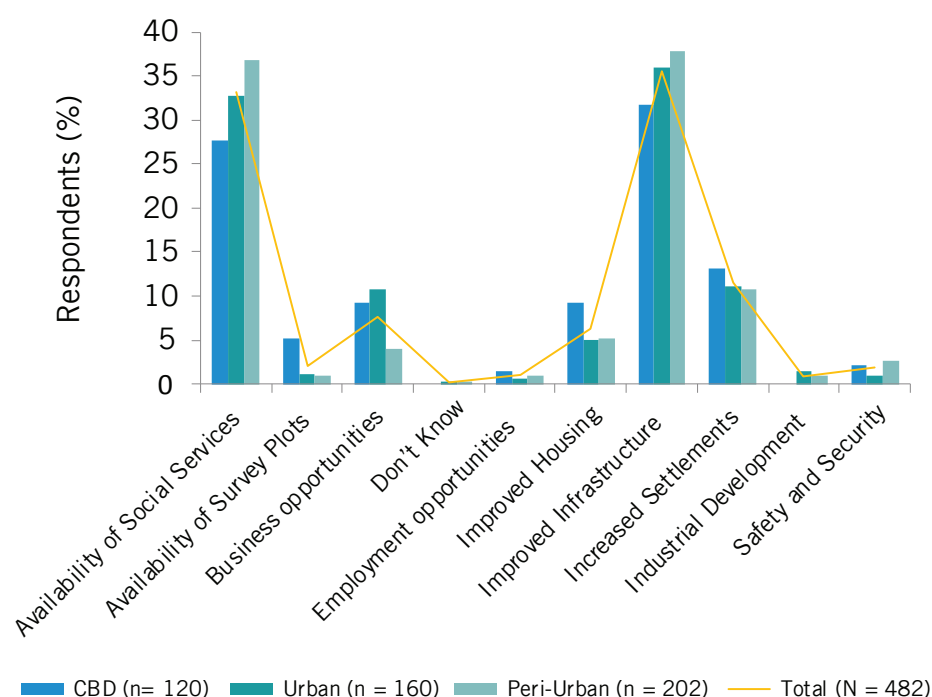
- Community knowledge on concepts for sustainable cities
- Practices of urban residents related to sustainable cities
- Status of sustainable city indicators.

- The study assumes that community knowledge influences the practices of urban residents and, hence, the effectiveness of national frameworks in addressing the challenges of urbanisation.

4.2.1 Knowledge on sustainable cities

Urban community knowledge on sustainable cities was assessed based on their responses during the household survey to an open-ended question on what respondents perceived/understood as indicators of a sustainable city. The results on urban community knowledge on sustainable cities are presented in Figure 4.

FIGURE 4: URBAN COMMUNITY KNOWLEDGE ON SUSTAINABLE CITIES



Source: Survey 2025

Improved infrastructure (35.6 percent of respondents) and availability of social services (33.1 percent of respondents) were the most frequently identified aspects of sustainable cities by urban households. Other aspects, such as business opportunities (7.6 percent), improved housing (6.2 percent) and safety/security (1.9 percent), received low recognition. These results imply that the awareness of sustainable cities is narrowly concentrated on infrastructure and social services while broader socio-economic and environmental dimensions are less understood. These knowledge gaps may hinder

holistic sustainability planning and implementation.

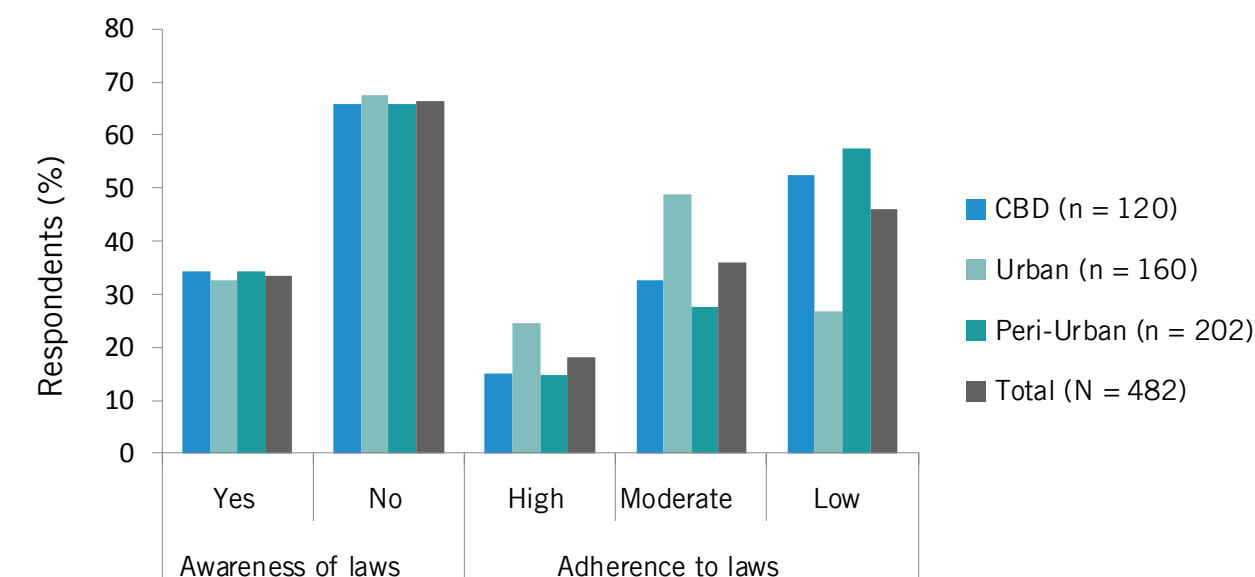
Awareness and adherence to laws

During the survey, participants were asked if they were aware of any laws/regulations related to sustainable cities. If they answered “yes”, respondents were asked to identify the specific law/regulations they were aware of. In addition, respondents were asked to rate the general level of adherence to laws/regulations related to sustainable cities as high, moderate or low.

Results in Figure 5 indicate that the majority (66.4 percent) of households are not aware of laws related to sustainable cities. Consistent with this finding, almost half (46.1 percent) of households reported low adherence to laws related to sustainable cities with only one-fifth of respondents (18 percent) reporting high adherence. Even where awareness exists, enforcement and compliance remain limited. These results support findings by Monstadt et al. (2025) who observed illegality, low or poor enforcement of laws related

to energy access and provision in urban Tanzania. Similarly, Mbilinyi et al. (2023) observed that issuance of land titles in urban settings remains low. Land titles for most urban dwellers are not guaranteed due to bureaucratic, inconsistent, expensive and/or untimely services. These results indicate that low adherence and enforcement of laws is contributed to both on the input side (service providers and enforcers) and the output side (urban communities, service users). The combined effect undermines city sustainability.

FIGURE 5: AWARENESS AND ADHERENCE TO LAWS



Source: Survey 2025

4.2.2 Practices on sustainable cities

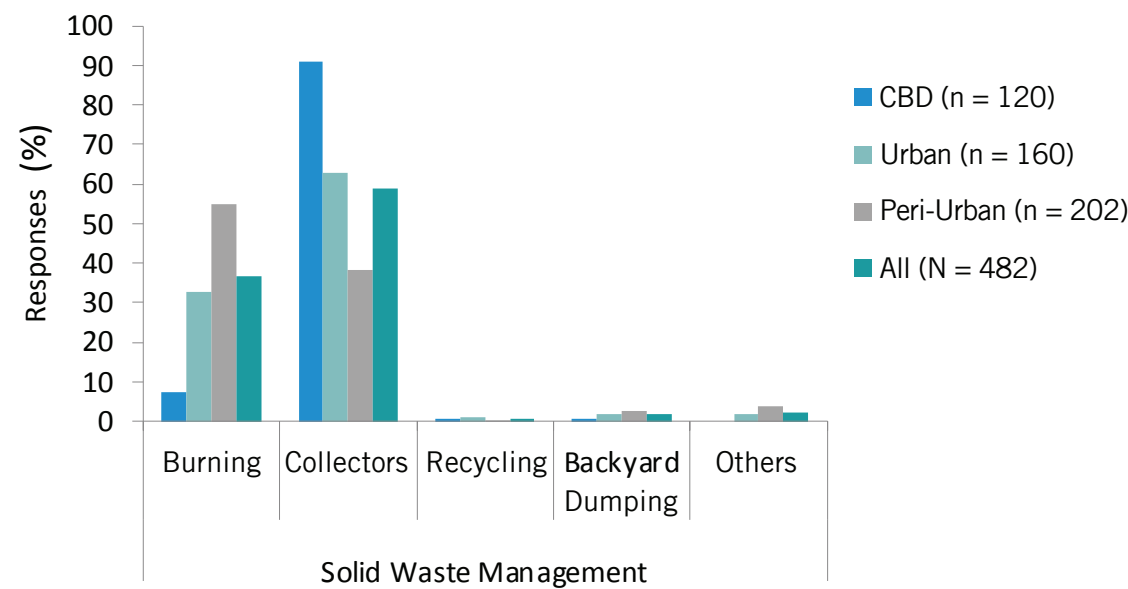
The survey asked respondents about household practices related to sustainable cities, including solid waste management, liquid waste management, use of clean energy, means of transport and tree planting. The results are presented in Figure 6, Table 2 and Figure 7.

Solid waste management

With respect to solid waste management, the findings indicate that approximately three in five households (58.7 percent) in Dodoma have their solid waste collected. However, results by location show that

household waste collection is much more common in CBD wards (90.9 percent of households) compared to peri-urban areas (38.2 percent of households). Burning waste (36.5 percent of all households) remains high, particularly in peri-urban wards (55.1 percent). The use of waste collectors in CBD wards is indicative of better waste infrastructure in those areas, while peri-urban areas resort to burning due to limited services. The extremely low recycling rates (0.8 percent of households overall) reflect a gap in the circular economy which is critical for urban sustainability.

FIGURE 6: COMMUNITY PRACTICES ON SOLID WASTE MANAGEMENT



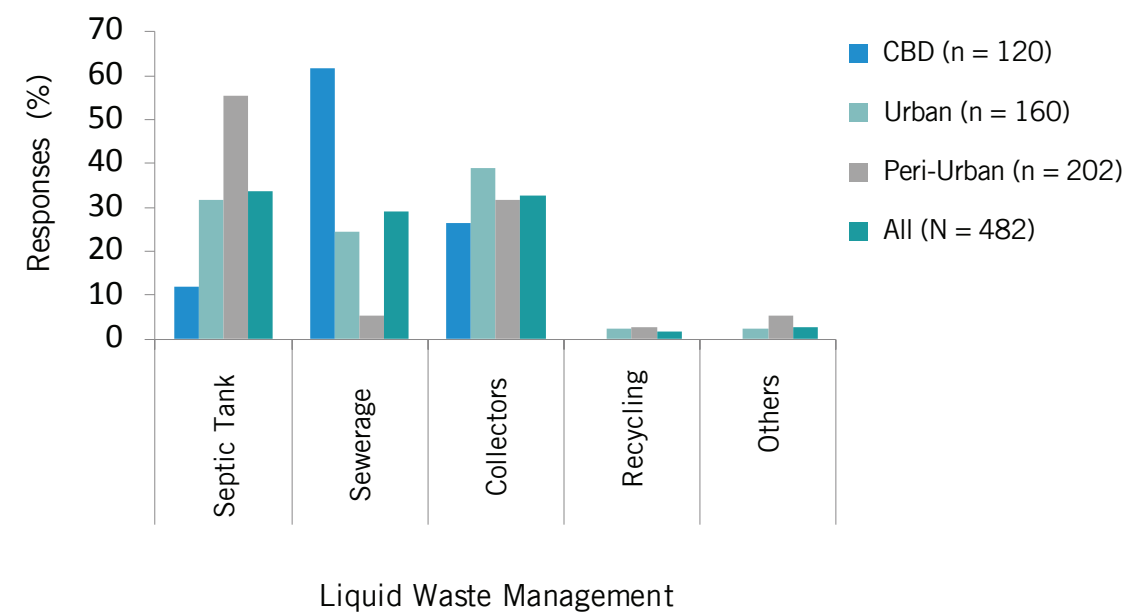
Source: Survey 2025

Liquid waste management

For management of liquid waste, the results in Figure 7 show that the sewerage system is used by the majority of residents in CBD wards (61.8 percent) but only 1 in 20 households in peri-urban areas (5.3 percent). Septic tanks (33.6 percent) and waste collectors (32.7 percent) are widely used in urban and peri-urban areas. These results indicate a significant disparity in sewage

infrastructure between CBD wards and areas further from the city centre. Most liquid waste ends up being deposited in Wastes Stabilisation Ponds (WSPs), which increases the risk of pollution in fast-growing peri-urban areas. As for solid waste management, recycling remains negligible (1.8 percent of all households).

FIGURE 7: COMMUNITY PRACTICES ON LIQUID WASTES MANAGEMENT



Source: Survey 2025

Clean energy uses

Results on household energy use in Table 2 indicate that charcoal (29.8 percent), electricity (25.2 percent) and gas (23.3 percent) are the most commonly used energy sources. Electricity usage is higher in CBD wards (35.5 percent) than in urban wards (22.3 percent) and peri-urban wards (21.7 percent). Overall, approximately 1 in 10 households (12.1 percent) still use firewood; in peri-urban wards firewood use is higher (19.5 percent). However, the use of solar energy (8.0 percent of households overall) is growing more in peri-urban wards (12.2 percent) than CBD wards (2.1 percent). The continued heavy dependence on charcoal and firewood is a significant issue for sustainability due to its impact on deforestation and emissions. Reasons for low usage of clean energy sources mentioned by respondents included high cost (78.8 percent), low awareness (17.1 percent) and availability (3 percent). These results indicate that energy poverty still persists in peri-urban areas where residents opt for biomass and cheaper energy sources. The observation on solar uptake in peri-urban wards is a promising entry point for promoting green energy.

Means of transportation

Results on means of transport for households (Table 2) indicate that public transport (33.5 percent), bodaboda (motorcycle) (27.2 percent), walking (15.1 percent) and bajaji (motorised three-wheeled vehicles) (15.1 percent) are the most common means of transport across all areas, largely due to their low costs and availability.

In Dodoma, public transport refers to the minibuses, commonly known as daladalas. They are privately owned but anyone can use them by paying fares, hence allowing many passengers to travel together in the same vehicle.

Very few households (4.2 percent) reported using private transport (private cars). This low level of ownership is advantageous for reducing carbon emissions. However, without appropriate regulation, the bodaboda and bajaji sector may pose safety, congestion and pollution challenges. Discussion with key informants indicated that the limited use of non-motorised transport (NMT) is mainly due to the non-existence or unpleasantness of urban infrastructure to support walking and cycling. The low use of NMT sets back efforts towards achieving a sustainable urban environment.

TABLE 2: URBAN COMMUNITY PRACTICES ON CLEAN ENERGY AND MEANS OF TRANSPORT

Variable	Practice	Responses (%)			
		CBD (n = 120)	Urban (n = 160)	Peri-urban (n = 202)	All (N = 482)
Energy use	Electricity	35.5	22.3	21.7	25.2
	Solar	2.1	6.7	12.2	8.0
	Firewood	2.1	9.4	19.5	12.1
	Kerosene	2.1	1.6	1.0	1.5
	Charcoal	30.5	33.1	27.0	29.8
	Gas	27.7	26.9	18.3	23.3
Means of transport	Others	0.0	0.0	0.2	0.1
	Private transport	5.9	2.7	4.7	4.2
	Public transport	27.5	29.8	40.2	33.5
	Motorcycle (bodaboda)	33.3	27.6	23.5	27.2
	Bajaji	14.4	18.0	12.8	15.1
	Bicycle	0.5	4.8	5.4	4.1
	Walking	18.5	16.4	13.3	15.6
Others	Others	0.0	0.8	0.0	0.3

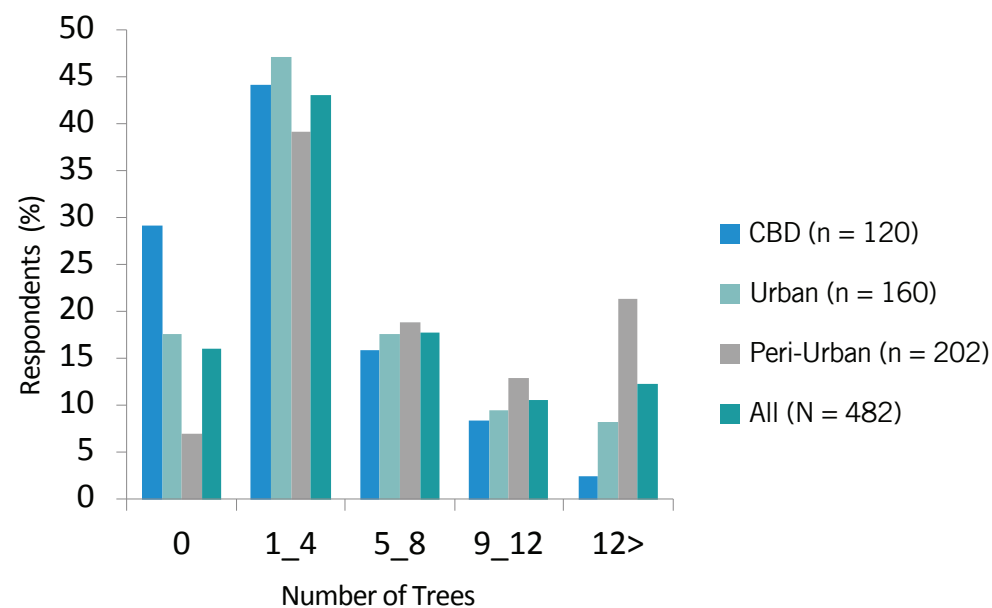
Source: Survey 2025

Tree planting

Tree planting is one of the practices for improving the sustainability of cities. Survey results (see Figure 8) indicate that almost half of all households (43 percent)

in Dodoma have planted between one and four trees around their premises. Households that have planted more than 12 trees are mostly in peri-urban (21.3 percent) while households with no trees are common in CBD wards (29.2 percent).

FIGURE 8: TREE PLANTING PRACTICES BY URBAN HOUSEHOLDS IN DODOMA



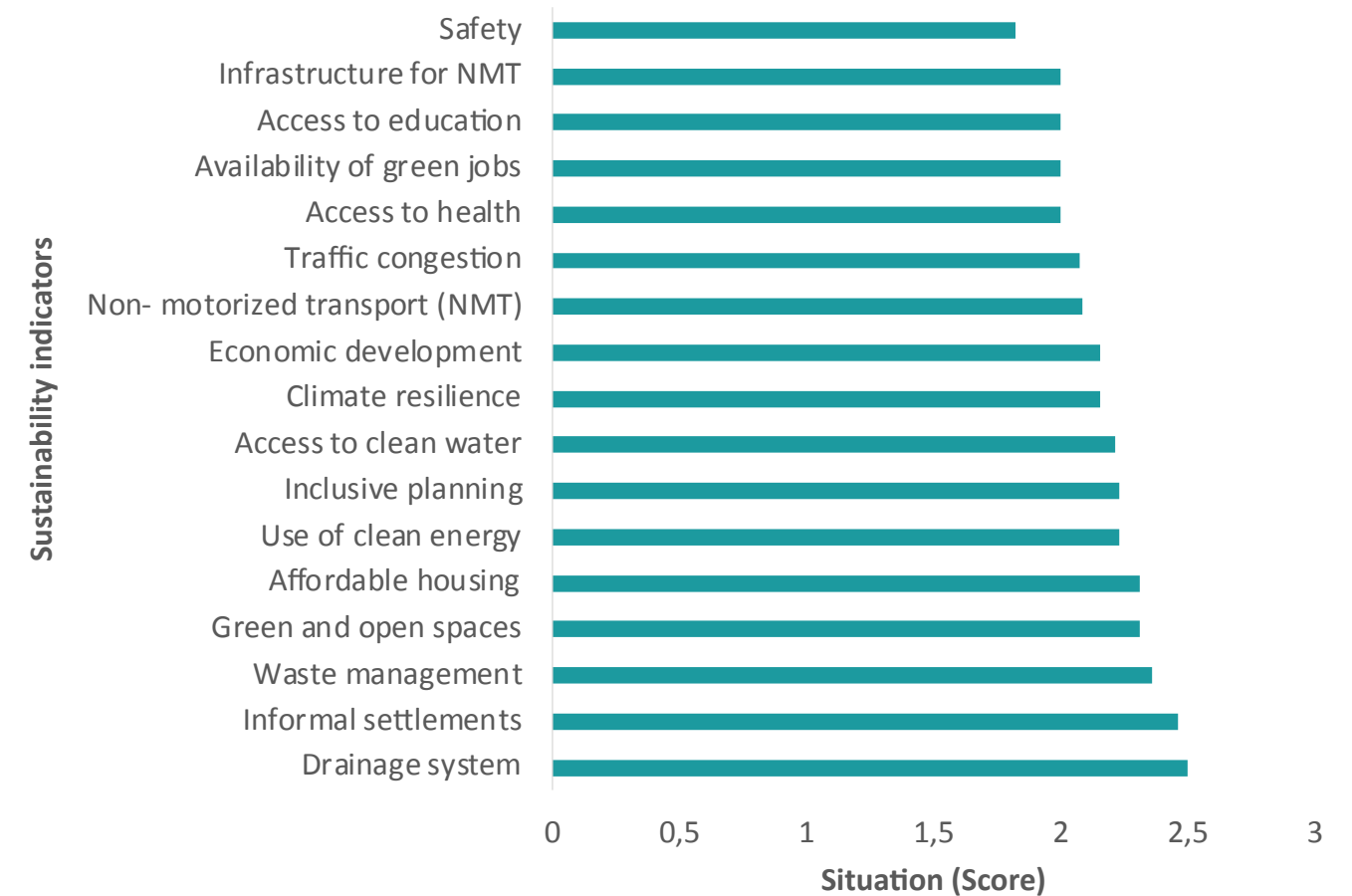
Source: Survey 2025

The observation that urban greening is stronger in peri-urban areas is attributed to land availability compared to CBD where density constraints limit urban greening. Other factors mentioned to limit tree planting included low awareness, drought and high costs. These results are similar to observations by Leopody (2023) and Francis et al. (2022) that water scarcity, limited space and the high price of seedlings were constraints to tree planting in semi-arid Dodoma. These results indicate challenges for green infrastructure integration in city centres but potential of peri-urban areas for urban forestry programmes.

4.2.3 Status of sustainable city indicators

Key informants were asked to assess each challenge of sustainability on a scale of 0 representing no challenge to 3 representing a serious challenge. Scores were summarised using a weighted mean (Equation 2) to indicate the perceived status of each sustainability indicator in Dodoma City. Results in Figure 9 indicate that the major issues that threaten the sustainability of Dodoma City include poor drainage systems, informal settlements and waste management. Lack of green/open spaces and affordable housing and limited use of clean energy also undermine the sustainability of the city. Other indicators were assessed as low to moderate challenges highlighting the need for government efforts to broadly improve the city's sustainability.

FIGURE 9: STATUS OF SUSTAINABILITY INDICATORS FOR DODOMA CITY



Source: Survey 2025

Overall, these results provide evidence that existing frameworks are not effective in enhancing the sustainability of Dodoma City, hence, the need to explore the adequacy and implementation challenges of these frameworks.

4.3 Challenges affecting implementation of frameworks for sustainable cities in Tanzania

Results on the challenges affecting implementation of frameworks for sustainable cities in Tanzania are presented in Table 3. The results indicate that implementation of the sustainable cities frameworks in Tanzania faces multiple interlinked challenges as presented in the sub-sections below.

TABLE 3: CHALLENGES AFFECTING IMPLEMENTATION OF FRAMEWORKS FOR SUSTAINABLE CITIES IN TANZANIA

Challenge	Score	Rank
Lack of coordination among institutions	15	1
Limited financial resources	13	2
Inadequate knowledge among implementers	10	3
Lack of monitoring mechanisms	10	4
Limited human capacity resources	10	5
Limited mandate	8	6
Lack of implementation strategies	6	7
Inadequacy of frameworks	4	8
Conflicting priorities especially in LGAs	1	9

4.3.1 Lack of effective coordination among institutions

Lack of coordination among institutions was identified as the most significant barrier. Urban development in Tanzania involves multiple ministries, local government authorities (LGAs), and non-state actors, yet collaboration is often weak, leading to duplication of efforts and fragmented policy implementation.

This is consistent with findings from other African countries, where institutional fragmentation undermines sustainable urban development (Olanrewaju & Sulaiman 2019; UN-Habitat 2020).

4.3.2 Limited financial resources

Another critical barrier is limited financial resources. Effective implementation of sustainable city initiatives requires significant investment in infrastructure, housing and services. However, participants in the FGDs and interviews with key informants noted that Tanzania’s urban financing is constrained by competing national priorities and reliance on donor support. Additionally, most LGAs depend more on soft loans and/or support from donors than revenues from own sources. For example, between 2013 and 2019, loans and grants accounted for 51.3 percent of the total budget for Dodoma City, intergovernmental transfers of capital development funds accounted for 2.6 percent while own source contributed only 1.3 percent (TULab 2019). This mirrors regional and global findings, where municipal governments face financing gaps that restrict their ability to implement urban sustainability agendas (UN-Habitat 2016; World Bank 2025).

4.3.3 Inadequate knowledge among implementers

Capacity-related challenges also ranked highly, including inadequate knowledge among implementers. Many stakeholders at both national and local levels lack adequate training, exposure and awareness of sustainable city frameworks, green technologies and inclusive planning approaches. This gap leads to poor planning, weak enforcement and limited adoption of innovative solutions as witnessed by practices of urban communities in relation to sustainable cities.

4.3.4 Lack of monitoring

The study further highlights lack of monitoring and evaluation (M&E) as a major challenge. Without robust tracking mechanisms, it becomes difficult to assess progress toward sustainability targets or ensure accountability in framework implementation. This gap has also been noted across Sub-Saharan Africa, where urban data systems are weak and SDG 11 monitoring remains limited (UN-Habitat 2016). Establishing a national urban data platform could support Tanzania in addressing this gap, in line with UNDP (2019) recommendations.

4.3.5 Limited human resource capacity

Interviews with key informants and FGDs revealed a shortage of skilled professionals (e.g., urban planners, environmental experts, data analysts and engineers)

within LGAs and implementing institutions. This constraint affects project design, implementation and long-term maintenance of urban initiatives. This is not unique to Tanzania; similar skill shortages have been reported in other African contexts (Cobbinah et al. 2015). Addressing this gap aligns with Tanzania Visions 2025 and 2050, which both stress investment in human capital as an indispensable pathway to sustainable development (URT 1999 & 2025).

4.3.6 Limited institutional mandate

Other challenges identified include limited institutional mandates. Some agencies and local authorities have restricted jurisdiction or limited autonomy in decision-making. This hinders effective implementation since many sustainability issues require cross-cutting authority. It was noted during FGDs that, although LGAs have powers in planning and resources allocation established by the Local Government Authorities Act of 1982, these powers are affected by overlaps and unclear boundaries on roles and responsibilities pursued by the central government. Budgeting, planning and grants allocation are determined by priorities of the central government (Mwasaga 2021). Sometimes, decisions made by district and regional commissioners, who are presidentially appointed, do not align with those of LGA officials. Additionally, central government staff (e.g., Land Officers) working at district/regional council level are not accountable to LGAs but to their respective ministers.

4.3.7 Lack of implementation strategies

Tanzania has several frameworks in place that are relevant to sustainable cities, but some lack practical strategies, action plans and localised guidelines. This creates a gap between framework goals and on-the-ground implementation.

4.3.8 Inadequacy of frameworks

Some existing frameworks do not comprehensively cover all aspects of sustainable cities such as climate resilience, social inclusion and green technologies. In addition, some policies and laws are outdated and far from accommodating contemporary indicators for sustainable urban development. For instance, the Human Settlement Development Policy (2000) and Urban Planning Act No. 8 (2007) do not include provisions for clean energy, climate change and NMT. This partial coverage limits their effectiveness. These



results echo global observations that many developing countries still lack comprehensive and integrated frameworks for sustainable urban development (UN-Habitat 2020; Nwaka 2005).

4.3.9 Conflicting priorities in local government authorities

Conflicting priorities at the LGA level emerged as a challenge, though it was ranked lowest. In practice, many LGAs prioritise immediate service delivery (roads, water and healthcare) over long-term sustainability. This conflict undermines the integration of sustainable development objectives into local planning. This observation is common across African cities, where

TABLE 4: POLICY OPTIONS FOR SUSTAINABLE CITIES IN TANZANIA

Option	Score	Rank
Coordination among stakeholders	9	1
Awareness creation	8	2
Adherence to plans	5	3
Capacity building	4	4
Social inclusion	2	5
Policy review	2	5
Enforcement of laws	2	6
Adherence to rules and regulations	2	6
Adaptation	1	8

4.4.1 Coordination among institutions and actors

Sustainable urban development requires collaboration between government agencies, private sector, civil society, academia and communities. However, in this research, lack of coordination among institutions and relevant actors was identified as among the key challenges in effective implementation of sustainable cities’ frameworks. Although the Urban Planning (Cooperation and Coordination) Regulations of 2018 meant to bring together stakeholders in urban development, the implementation of these regulations has been a challenge. Poor coordination often leads to

political and financial pressures push local authorities toward short-term objectives (Cobbinah et al., 2025).

4.4 Policy options and strategies for sustainable cities in Tanzania

Based on the information derived from the key informant interviews, FGDs and the household survey, Table 4 lists and ranks the policy options to improve urban sustainability in Tanzania. The options are discussed in the sub-sections below.

duplication of efforts, conflicting policies and inefficient resource use. Strengthening stakeholder coordination will help to ensure integrated planning, resource sharing and joint implementation of sustainability initiatives.

4.4.2 Awareness creation

Public understanding and support are essential for sustainable cities. Awareness campaigns on environmental protection, waste management, renewable energy and sustainable transport can encourage behavioural change. Results on community knowledge indicated low awareness of frameworks for urban sustainability hindering the adoption of beneficial practices. Raising awareness will empower citizens to

participate in decision-making and adopt sustainable city practices.

4.4.3 Adherence to plans

Results on sustainable city frameworks indicate that several frameworks, including specific city master plans, exist but are not implemented accordingly. Ensuring strict adherence to approved urban development plans helps control unplanned settlements, protect green and open spaces, and improve service delivery. Strengthening planning enforcement will help Tanzanian cities grow in a more organised and sustainable manner.

4.4.4 Capacity building

Urban authorities and stakeholders often lack adequate skills, financial resources and technical knowledge to implement policies for urban sustainability. Capacity building for city staff is required to implement city plans, financial resources need to be available to support implementation of sustainable city initiatives, and institutional capacity enhanced to carry out activities effectively. Human resource capacity can be strengthened through various training programmes as well as exposure to other cities. Financial resources can be enhanced through adequate allocation of funds, partnerships with international organisations or cities with successful sustainability models, and/or through public-private partnerships (PPPs). This is in line with the observations and recommendations by Tanzania Urbanisation Laboratory (TULab 2019) that LGAs should reduce their financial dependence on the central government, enhance their own source collection, and effectively utilise budget support for sustainable city development.

4.4.5 Social inclusion

Sustainable cities depend on equity and inclusivity. Therefore, vulnerable groups, such as women, youth and low-income households, need to be included in planning and decision-making on issues related to sustainability. This will help to ensure that future urban initiatives benefit all groups and reduce inequalities.

4.4.6 Policy and strategic review

Some existing frameworks are outdated, fragmented or inadequate and some have conflicting elements, making it difficult to achieve sustainable cities. Policies and laws such as the Human Settlements Development Policy (2000), Urban Planning Act No. 8 (2007), Land Act 4 (1999) and Land Use Planning Act (2008) are largely outdated and need to be reviewed. Also, a specific urban development policy or National Sustainable Cities Strategy could be considered. Ghana, which is a leader in urban sustainability in Africa, has developed a 2025 Sustainable Cities Strategy (World Bank 2025). Reviewing and harmonising policies on urban planning, land use, housing, energy and environment will provide a more coherent framework for urban sustainability in Tanzania.

4.4.7 Enforcement and adherence to laws

Results on institutional challenges indicated that even where laws exist, adherence is low and enforcement is often weak. Various factors for low adherence and enforcement were mentioned by study participants, including low awareness, low participation, fines and penalties, corruption, lack of resources and political interference. Lax or lack of enforcement and adherences to rules, regulations and laws hinders effective implementation of frameworks to attain sustainable cities. Therefore, mechanisms for enforcement of laws need to be strengthened to improve sustainability. This will help to ensure that all stakeholders adhere to regulations for sustainable cities, including provisions in current city plans.

4.4.8 Adaptation

Adaptation to climate change was ranked lowest but remains crucial. Tanzanian cities face risks such as flooding, drought and heat stress. Building resilient infrastructure, promoting green buildings and investing in climate-smart practices will help cities adapt to changing conditions and more frequent and extreme weather events.

5 | Conclusions and Recommendations

5.1 Conclusions

This research analysed existing policy frameworks and the institutional set-up for promoting the development of sustainable cities in Tanzania. The following conclusions can be drawn from the evidence collected:

1) Many sectors and institutions are involved in the implementation of frameworks for sustainable cities in Tanzania, including central government ministries, government authorities and agencies, local government departments and sectors, development partners, international organisations, universities, research institutions and the private sector. However, the coordination is often weak, leading to duplication of efforts and fragmented implementation of frameworks for promoting sustainable cities.

2) Tanzania has developed a range of frameworks with the objective of promoting sustainable urban growth, including visions, policies, laws, regulations, programmes, strategies and projects. To a large extent, these frameworks are aligned and informed by global goals such as the Sustainable Development Goals (SDGs) and international sustainability frameworks. The frameworks are useful in guiding, directing and managing urban development activities and service provisioning. However, some are inadequate, outdated and lack implementation strategies.

3) The effectiveness of the existing frameworks to promote urban sustainability is hindered by several factors including lack of effective coordination, limited financial and human resources capacity, low awareness among implementers, and inadequacy and lack of monitoring mechanisms. Other challenges include limited mandate for LGAs, lack of implementation strategies and conflicting priorities.

4) These challenges in implementation of frameworks affect the realisation of sustainability across many key areas, including clean energy usage, affordable housing, waste management, green job availability, access to surveyed land, urban economies, social inclusion, equity and NMT infrastructure.

5) Major issues that threaten the sustainability of Dodoma City include poor drainage systems, informal settlements, waste management, and lack of green/open spaces, affordable housing and limited use of clean energy.

5.2 Recommendations

Based on the identified challenges that hinder implementation of frameworks to foster development of sustainable cities in Tanzania, the following are policy and practical recommendations to the government at national and local government levels.

5.2.1 Policy recommendations

Establish a National Urban Development Authority

To address the structural and institutional challenges, especially low coordination of urban development among stakeholders, a specific Urban Coordination Authority or Urban Coordination Agency is recommended at the national level with sub-units at local and regional levels. It is recommended that the entity is chaired by a high-level official (e.g., from the Prime Minister's Office or a Ministerial-level steering committee) with formal representation from key ministries, LGAs, utility regulators, donors and civil society. The authority will require clear Terms of Reference and Standard Operating Procedures for vertical (national–regional–LGA) and horizontal coordination. The establishment of this body will help to avoid duplication of activities, reduce delays and prevent conflicts of interest. A model for this institution may be drawn from the Republic of South Africa where the Integrated Urban Development Framework (IUDF) of 2019 was developed to ensure coordinated, integrated planning and development of cities and towns (Republic of South Africa 2019).

Increase and diversify financial sources for sustainable cities

The challenge of insufficient financial resources can be overcome through increasing and diversifying financing sources for sustainable urban infrastructure and services. Actions required may include:

- Developing a National Urban Investment Strategy that identifies financing gaps, prioritises bankable projects, and maps funding sources, such as public budgets, PPPs, municipal bonds, climate finance, donor grants and land value capture;
- Piloting municipal revenue reforms to improve property tax collection;
- Introducing targeted service fees; and/or
- Enabling LGAs to retain a larger share of locally raised revenue.

Other options may include proposals to access international funds related to sustainable cities, for example, the UN Framework Convention on Climate Change (UNFCCC) Green Climate Fund or Adaptation Fund.

Strengthen human resources capacity

Addressing the challenge of human resources capacity will necessitate staff recruitment and strengthening technical skills and institutional knowledge across all implementing bodies. This can be achieved through national urban capacity building programmes that feature standardised training modules on sustainable cities (urban) planning, climate resilience, inclusive housing, data management and project management for LGA staff and implementers. Exposure to more advanced sustainable cities may also be an option. Universities and research institutions can play a great role in capacity building through training and research. Another option for capacity building is the introduction of continuous professional development linked to promotion/career paths for key personnel in sustainable city planning and implementation, such as planners and environmental officers in LGAs.

Provide legal mandate to LGA and agencies

Ensuring that LGAs have the requisite legal authority to implement sustainable city interventions will help to address the challenge of limited mandate. Actions required to achieve this outcome may include:

- Reviewing and revising legislation/regulations that constrain LGA roles (planning approvals, revenue retention, public-private contracting) and enable delegated powers for key urban functions;
- Introducing legal frameworks for integrated urban planning that mandate cross-sectoral

coordination (land use, transport, waste, utilities).

Review frameworks to include all dimensions

To address the challenge that existing frameworks for sustainable cities in Tanzania are inadequate, the frameworks need to be reviewed and amended to cover all dimensions of sustainability, including climate resilience, non-motorised transport, social inclusion, affordable housing and green infrastructure. This may involve updating policies and their associated instruments, such as laws and regulations, to align with the contemporary requirements for sustainable cities.

Establish a robust monitoring and evaluation system

A robust monitoring and evaluation (M&E) system needs to be put in place to track progress and inform decision-making for urban sustainability. Actions required include:

- Updating the national set of sustainable city indicators to align with standard international frameworks;
- Establishing a digital Urban Data Platform for routine collection, visualisation and public reporting;
- Making M&E a funding prerequisite for major urban projects; and
- Adopting technology, such as mobile surveys, cameras, GIS mapping and remote sensing, to fill data gaps and monitor service delivery and status of sustainable city indicators.

5.2.2 Practical recommendations

Align local priorities with national sustainability goals

Aligning local priorities with long-term sustainability goals will help to address the challenges of conflicting priorities especially in LGAs. This can be achieved through:

- Introduction of performance-based grants for LGAs tied to sustainable city indicators as incentives for long-term planning;
- Strengthening public participation and community feedback mechanisms to build local buy-in for long-term sustainable city projects; and

- Use of visible, rapid-impact projects to demonstrate benefits of sustainable investments alongside longer-term infrastructure.

Translate all frameworks into clear implementation strategies

To ensure their effective implementation, policies need to be translated into clear implementation strategies. Every national urban policy should be accompanied by a three to five-year implementation plan with budgets, roles and milestones. In addition, LGA-level Urban Action Plans need to be developed that are aligned with the national plan and integrated into LGA annual plans and budgets.

Strengthen mechanisms for law enforcement

To improve adherence and enforcement of laws and regulations related to urban sustainability, the study recommends the establishment/enhancement of municipal compliance and inspection units, the fair application of fines for illegal dumping, uncontrolled building or tree destruction, and the provision of incentives for compliance with sustainable activities (solar, rain harvesting, recycling). Other measures may include community enforcement through neighbourhood associations and the use of digital tools to track land use and construction violations.

Develop and implement programmes for awareness raising

To improve adherence to laws and policies, more capacity building strategies, such as community meetings and workshops, need to be organised to engage local communities on how to transform unsustainable behaviors into resilient and sustainable practices. In addition, LGAs may provide infrastructure for waste collection and sorting (e.g., bins, sorting equipment) in populated centres such as markets, bus stations, bodaboda stations, schools, playgrounds and religious institutions.

Improve infrastructure and promote the use of NMT

Last but not least, the research recommends improving infrastructure and promoting the use of NMT to encourage walking and cycling. Advocacy strategies like car free month, week or day may be established.



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