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Urban Sustainability Planning and Urban Outcomes in Rapidly Growing Cities in Mogadishu, Somalia

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Abstract

Rapid urbanization in fragile and post-conflict cities has intensified challenges related to environmental degradation, informal settlement expansion, inadequate infrastructure, weak governance, and unequal access to urban services. This study examined the influence of environmental and social sustainability planning and institutional and governance capacity on urban outcomes in Mogadishu, Somalia. The study adopted a quantitative, descriptive, and correlational research design using data collected from 280 respondents, including residents and NGO/CSO representatives of the barangay. Data were analyzed using descriptive statistics, Relative Importance Index (RII), Pearson correlation, and multiple regression analysis.

The findings revealed that environmental and social sustainability planning positively and significantly influenced urban outcomes, whereas institutional and governance capacity emerged as the weakest sustainability dimensions, although it remained a significant predictor of urban outcomes. The regression model explained 66% of the variation in urban outcomes, indicating a strong explanatory power. The study concludes that sustainable urban development in Mogadishu requires integrated environmental planning, inclusive service delivery, stronger institutional coordination, transparent governance, and community participation. The findings contribute to the urban sustainability literature by providing empirical evidence from a rapidly growing and institutionally fragile post-conflict city context.

1. INTRODUCTION

Urbanization is a major force shaping contemporary development, especially in rapidly growing cities in the Global South. As urban populations increase, cities face growing pressure to provide housing, transportation, sanitation, water supply, energy, employment opportunities, and environmental protection amid rising demand and limited institutional capacity. According to a report (United Nations Department of Economic and Social Affairs Population Division, 2018), the world will see urban populations rise to nearly 70% of the global population by 2050, with a large portion of this increase occurring in developing nations. Although urbanization can drive economic development, innovation, social interaction, and infrastructural modernization, poorly managed urban growth can also lead to the expansion of informal settlements, environmental degradation, unequal access to services, congestion, and increased exposure to climate risks (Tal, 2025). Consequently, sustainable urban planning has emerged as a key framework for managing urban expansion by integrating economic growth, social inclusion, environmental protection and urban resilience (Wei et al., 2025).

Mogadishu, the capital city of Somalia, provides an important case for examining sustainable urban planning in fragile and post-conflict contexts. Historically, Mogadishu was strategically located on the Indian Ocean trade route, connecting Somalia with Arabia, Persia, India, and Europe, facilitating the early development of trade, culture, and cities (Jama, 1996). However, urban governance and planning systems have been severely weakened by decades of political turbulence, civil unrest, institutional dysfunction, and economic disruption. These factors have led to weak infrastructure, an increase in

informal urban growth, inequities in access to basic services, and inadequate land use planning (Assaye et al., 2026). Therefore, the current urban problems are not the only consequence of population growth in Mogadishu but also stem from historical disruption, a lack of institutional capacity, and a lack of coordinated spatial planning.

The need for sustainable urban planning in Mogadishu is bolstered by urbanization dynamics in the Horn of Africa and East Africa. Nairobi, Addis Ababa, Djibouti City, and Mogadishu are among the cities undergoing demographic and spatial growth as a result of rural-urban migration, the search for economic opportunities, internal displacement, and regional insecurity (Hassan et al., 2023). Mogadishu is witnessing an influx of migrants and IDPs, creating a surge in demand for land, shelter, roads, drainage, waste disposal, water supply, and other vital city services. However, in some instances, the city's growth has occurred in an uncoordinated and poorly regulated manner, exacerbating environmental problems, traffic congestion, informal settlement growth, and social inequality (Pandey et al., 2025). These pressures highlight the need for an integrated planning approach that is environmentally sustainable, socially inclusive, institutionally coordinated, and responsive to the challenges of fragile urban governance in the region.

Theoretically, this study is based on urban growth and sustainable development theories. The spatial development of cities, such as the formation of informal settlements, spatial gaps in urban infrastructure, urban sprawl, and land use change, can be understood from the perspective of Urban Growth Theory (Tuan, 2026). This is especially important for Mogadishu, where rapid and sometimes unplanned growth has reshaped the city’s physical environment and increased the pressure on existing urban services. Sustainable Development Theory complements this perspective, focusing on the importance of balance between economic development, social equity, environmental protection, and intergenerational balance for well-being (Oyeleye & Bigon, 2026). Together, these theories offer a comprehensive perspective on the urban transformation of Mogadishu as an urban growth process, but also as a governance, sustainability and resilience issue.

Although Mogadishu has emerged as the political, economic, and population hub of Somalia, sustainable urban planning in the city remains underdeveloped, poorly implemented, and weakly coordinated across sectors. Interventions by public authorities, private actors, and development partners are usually fragmented, project-based, and lack the ability to tackle the multifaceted aspects of a city's sustainability issues (Ahmadi Dehrashid et al., 2026). However, there is limited empirical evidence on the interplay between the design and implementation of environmental sustainability planning, social inclusion, and institutional governance capacity for sustainable urban development in Mogadishu (Nor, 2025). This gap makes it difficult to gain a scholarly understanding and guide policies for managing rapid urban growth in fragile and post-conflict cities.

Rapid urbanization in Mogadishu has magnified environmental degradation, informal settlement growth and development, poor infrastructure, congestion, poor service provision, and the absence of effective urban governance in Mogadishu. Sustainable urban planning is gaining traction as a critical component

of enhancing urban resilience and livability; however, sustainable planning in Mogadishu is poorly coordinated and inconsistently applied in the environmental, social, and institutional aspects (Ahmed et al., 2025). Existing studies have largely examined urban problems such as governance, environmental degradation, and infrastructure deficits separately, with limited empirical evidence on how environmental sustainability planning, social sustainability planning, and institutional and governance capacity collectively influence urban outcomes in Mogadishu (Mohamed et al., 2025). Therefore, this study explores how the dimensions of sustainability planning affect urban outcomes in Mogadishu, Somalia.

In this context, the current study is a critical analysis of sustainable urban planning in Mogadishu, considering three interrelated aspects: environmental sustainability planning, social sustainability planning, and institutional and governance capacity. This study extends the urban growth and sustainable development discourse to fragile post-conflict cities under multiple pressures from population growth, displacement, infrastructure deficits, environmental risks, and institutional coordination challenges. The findings are expected to provide practical insights for policymakers, municipal officials, urban planners, urban development partners, and researchers interested in inclusive, resilient, and environmentally friendly urban development in fragile urban settings such as Mogadishu.

2. LITERATURE REVIEW

2.1 Urbanization, Sustainability Planning, and Urban Outcomes

Urbanization has become one of the most dominant forces influencing development outcomes in rapidly growing cities, especially in the Global South. While urbanization can help foster economic development, job creation, innovation, infrastructure development, and social change, it can also lead to the emergence of informal settlements, environmental degradation, congestion, poor service provision, and an increase in social inequalities (Li et al., 2024). This implies that urban development is not necessarily associated with positive outcomes. Instead, it is influenced by the robustness of sustainability planning, institutional capacity, and governance systems.

Urban sustainability planning is defined as the coordinated planning of land use, infrastructure, and environmental, social, and institutional governance to enhance long-term urban outcomes. According to (van Berkum, 2023), integrated land-use planning, efficient infrastructure, green spaces, and smart city systems are the main aspects of a 5sustainable city, whereas (Agyemang & Sahana, 2025) highlighted resilient infrastructure, participatory governance, and climate-sensitive urban design. These strategies are significant because they connect planning choices to measurable urban outcomes such as enhanced livability, accessibility of services, quality of the environment, resilience, and social equity. Nonetheless, a great deal of sustainability planning literature is based on the relatively stable institutions of cities. Its use in weak and fast-developing cities is minimal because of the common challenges faced by these cities, such as poor municipal capacity, land governance, limited public finance, informal development, and ineffective enforcement.

2.2 Sustainable Urban Planning

Sustainable urban planning is the process of managing urban development in a manner that balances economic development, social equity, environmental protection, and institutional effectiveness. (Spiliotopoulou & Roseland, 2020) argue that urban sustainability requires cities to meet present needs without compromising the ability of future generations to access essential resources and services. This perspective shifts planning from short-term infrastructure provision to long-term resilience, resource justice, and intergenerational responsibility.

However, sustainable urban planning should not be considered a technical process. Despite the necessity of drainage systems, green infrastructure, road networks, housing programs, and waste management systems, they may fail to deliver inclusive urban outcomes when land access, inequality, public participation, and institutional accountability are not considered in the planning process (Roseland & Spiliotopoulou, 2016). Sustainability policies may tend to be technocratic in rapidly growing cities when they focus on the modernization of cities without considering informal communities, displaced groups, and low-income families. Thus, it is necessary to comprehend sustainable urban planning as a spatial environmental and governance equity process. It should not only be measured in terms of the expansion of infrastructure but also whether it enhances the quality of the environment and access to services, social inclusion, and institutional responsiveness.

2.3 Theoretical Framework: Urban Growth and Sustainable Development

Urban Growth Theory is a useful framework for examining how land-use change, urban sprawl, informal settlement development, infrastructure expansion, and shifting population distribution shape urban growth (Dehghani et al., 2025). This theory applies to fast-growing cities because it can be used to understand why urban land is becoming an increasingly contentious issue and why infrastructure does not tend to keep pace with the increase in population. Urbanization in a place like Mogadishu is influenced by natural population growth coupled with rural-urban migration and internal displacement, economic concentration, and post-conflict reconstruction.

However, Urban Growth Theory has limitations when applied to fragile urban contexts. It tends to focus on the spatial and economic forces of urban growth but pays too little attention to conflict, displacement, insecurity, institutional breakdown, humanitarian patterns of settlement and uneven state power. Urban growth in fragile cities is not merely a product of demographics or market forces but is also influenced by the ineffectiveness of urban governance, informal land tenure systems, and regulatory incompetence (Aflaki Samani et al., 2025). Thus, Urban Growth Theory is an analytical tool that is inadequate in itself. It then needs to be supplemented with sustainability and governance views to clarify why rapid urban development can lead to unequal, fragmented, and risky environments.

Sustainable Development Theory complements Urban Growth Theory because it focuses on the equilibrium between economic development, social justice, and environmental conservation. According

to (Mirsafa et al., 2025) argue that sustainable development needs to be coordinated over a long period in terms of growth, inclusion, and environmental responsibility, whereas (Basilico et al., 2026) define resilience as a key aspect of sustainability. However, Sustainable Development Theory may become too broad or abstract if the notions of sustainability, resilience, and inclusion are not connected to quantifiable indicators. In rapidly expanding urban areas, the sustainability of urban development should be evaluated based on tangible urban outcomes, including water access, sanitation coverage, housing security, waste management, drainage performance, road accessibility, land-use enforcement, environmental quality, and community participation (D'Adamo et al., 2025). In the absence of such indicators, sustainability may become a broad policy catchphrase rather than an analytical framework.

2.4 Environmental Sustainability Planning and Urban Outcomes

Environmental sustainability planning lies at the heart of urban outcomes because rapid urban development places pressure on land, water systems, drainage systems, air quality, waste disposal and energy supply (Yu et al., 2024). Similarly, (Kalfas et al., 2023) argue that environmental degradation intensifies when infrastructure and regulatory frameworks fail to keep pace with urban growth. Poor environmental planning in rapidly growing cities may lead to floods, poor sanitation, solid waste accumulation, traffic congestion, pollution, and a general decrease in livability.

However, technical interventions should not be limited to sustainability. There is a need for better drainage, green infrastructure, solid waste systems, and climate-sensitive design, which cannot bring sustainable results without institutional implementation, municipal funding, urban data, and stakeholder coordination. Fragmented urbanization in Mogadishu has been linked to environmental pollution, poor infrastructure, traffic congestion, and social inequality (Muchunu et al., 2023). This shows that inadequate infrastructure, coupled with poor governance, informal construction, limited public investment, and poor coordination among planning actors, are all factors that influence environmental outcomes.

2.5 Social Sustainability Planning and Inclusive Urban Outcomes

Social sustainability concerns equity, involvement, livability, and equitable access to urban services. According to (Titz & Chiotha, 2019), sustainable urban practices should enhance livability, foster inclusiveness, and enhance resilience to climate-, economic, and migration-related stressors. This is significant because urban sustainability cannot be attained through physical development alone; it should guarantee that various social groups benefit from urban development.

Social sustainability in fast-developing cities is positively associated with access to housing, tenure security, government services, livelihoods, and involvement in planning processes. According to (Abdulle, 2026) Note that reconstruction efforts in Mogadishu after the conflict have drawn migrants and displaced people, putting pressure on land, housing, infrastructure and services. Nevertheless, displaced

and informal communities are usually regarded as passive recipients of services, as opposed to active participants in the urban-planning process. This undermines inclusive city outcomes because planning decisions might fail to consider the needs of vulnerable populations. Therefore, social sustainability planning must focus on housing security, fair service provision, participatory decision-making, and the security of low-income groups and displaced populations. In the absence of this social justice orientation, sustainability policies may replicate exclusion rather than alleviate it.

2.6 Institutional Governance Capacity and Urban Outcomes

Institutional governance capacity is one of the most important factors connecting sustainability planning and urban outcomes. Successful planning requires municipal power, law enforcement, funding, technical skills, stakeholder coordination, accountability and public participation (Mottelson & Wolff, 2025). According to (Melese et al., 2026), local authorities and international partners tend to implement interventions in urban areas in a disorganized and uncoordinated manner with a narrow scope. This type of fragmentation makes planning less effective because individual projects can solve short-term issues without revising the structural issues of urban development.

Weak governance is not only an obstacle to implementation in weak and fast-growing cities but also a fundamental cause of poor urban outcomes. Weak institutions facilitate informal construction, poor land-use management, unequal services, poor environmental management and redundancy of development activities. Thus, governance capacity should be considered a key explanatory variable in urban sustainability studies. Mogadishu needs better urban outcomes through increased municipal funding, land management, regulation, planning, coordination, accountability to the people, and community involvement (Abdi & Dirie, 2017). Unless environmental and social sustainability planning is strengthened institutionally, it will not be able to translate into lasting living conditions, resilience, and equity in cities.

2.7 Empirical Evidence from Rapidly Growing Cities and Mogadishu

Empirical evidence is accumulating on African urbanization, indicating that high rates of urbanization are influenced by migration, displacement, inadequate infrastructure, informal land use, poor governance, and environmental pressure. According to (Kamana et al., 2024) state that local and contextualized planning strategies are needed in African cities since generic urban models do not tend to reflect the institutional, spatial, and social realities of African urban development. This point applies to Mogadishu since the city not only undergoes a demographic process, but it is also a governance and post-conflict rebuilding issue. Similarly, (Rsif et al., 2023) highlighted the weaknesses of generic sustainability indicators in the context of African cities and demanded urban assessment frameworks specific to each city that consider the socioeconomic, spatial, cultural, and historical contexts of these communities. This intensifies the necessity of assessing urban outcomes in Mogadishu based on local indicators, including access to services, infrastructure sufficiency, environmental quality, social inclusion, adherence to land-use plans, and community involvement.

The argument that urban sustainability planning must be associated with the capacity to govern is further supported by recent evidence on informal settlements. In a review of informal settlement literature on urban centers in Africa, such as Mogadishu, (Mottelson, 2023) demonstrates that informal settlements are not single housing issues but are directly related to land governance, inadequate infrastructure, political settlements, service exclusion, and poor institutional coordination issues. (Ewnetu & Seo, 2025) similarly shows that informal settlement governance in Africa is influenced by the complex interaction of stakeholders, fragmented roles, and implementation gaps. These results are significant, as they demonstrate that to achieve better urban outcomes in rapidly expanding cities, it is necessary to upgrade them physically and through coordinated governance, comprehensive planning, and safe tenure systems, and to enhance the capacity of the municipalities.

The East African experience in urbanization shows that rapid growth can increase environmental vulnerability when urban planning systems are unable to meet the needs of the increasing population. Inadequate infrastructure, lack of proper drainage, uncontrolled land development, and lack of municipal capacity may increase exposure to flooding, sanitation, waste collection, and climate risks. This directly translates to Mogadishu, where uncontrolled and rapid urbanization strains drainage, road systems, housing, sanitation, and waste disposal systems. Therefore, environmental sustainability planning should consider the availability of infrastructure and effective systems of governance that regulate land utilization, reduce risk exposure, and align climate-sensitive urban development.

The urban path of Mogadishu is influenced by historical and modern pressures. Previously, the city was a major trading hub due to its strategic location along the Indian Ocean, which helped in trade and early urbanization (Jama, 1996). However, these formal urban management systems have been compromised, resulting in fragmented infrastructure, informal housing, and unequal service provision due to political instability, civil strife, institutional degradation, and disrupted economies (Baye, 2025). More recent studies suggest that disjointed urban growth in Mogadishu is associated with environmental degradation, traffic jams, lack of infrastructure, and social inequalities (Mrani et al., 2025).

Nevertheless, disjointed literature still exists despite these contributions. Numerous studies have been conducted on housing, environmental degradation, displacement, infrastructure, and governance in isolation, as opposed to the interactions of these factors in determining urban outcomes. This is a significant drawback, as the problems of urban sustainability are interconnected. Poor land-use management results in informal settlement development; informal settlements exert pressure on water, sanitation, and drainage systems; poor infrastructure exposes the environment to vulnerability; and poor governance reduces the capabilities of authorities in coming up with long-term solutions. Therefore, more detailed empirical research is required to explore the effect of sustainability planning on urban performance in rapidly developing and institutionally weak cities.

2.8 Research Gaps

The literature validates the need to adopt sustainable urban planning to improve urban performance in fast-growing cities, particularly regarding urban sprawl associated with a lack of infrastructure,

environmental degradation, informal settlements, and inefficient governance (Haou et al., 2025). However, the literature is mostly based on institutionally stable cities, which restricts its relevance to vulnerable and post-war settings, such as Mogadishu, where municipal capacity, land governance, public finance, and regulatory enforcement are fragile (Nor & Raheem, 2025).

There are also gaps in theory and empirical research. Urban Growth Theory explains spatial expansion with little attention to conflict, displacement, and institutional weakness, but Sustainable Development Theory frequently lacks quantifiable measures of urban outcomes (Wang & Zhao, 2025). The current literature on Mogadishu only discusses environmental degradation, inequality in services, informal settlements, displacement, and weak governance independently of each other, but not as interrelated effects of sustainability planning (Atkinson, 2024).

This study addresses these gaps by examining the interplay of environmental sustainability planning, social sustainability planning, and institutional governance capacity in affecting urban outcomes in Mogadishu. The measures of urban outcomes are livability, accessibility of services, environmental quality, sufficiency of infrastructure, social inclusion, resilience, and effectiveness in planning. This combined methodology contributes to the current body of literature by going beyond descriptive accounts of urban development and providing critical insight into how sustainability planning affects urban realities in fast-growing, vulnerable cities.

3. METHODS AND MATERIALS

3.1 Study Design

The method employed in this study was a quantitative, descriptive and correlational approach in order to investigate the effect of urban sustainability planning on urban outcomes in the city of Mogadishu, Somalia. The descriptive design was used to describe respondents' perceptions of environmental sustainability planning, social sustainability planning, institutional and governance capacity and urban outcomes. A correlational design was employed to examine the strength and direction of the relationship between the study variables, and regression analysis was conducted to ascertain the predictive power of the sustainability planning dimensions on urban outcomes. The study aimed to produce measurable and statistically testable evidence of the effect of sustainability planning on urban development outcomes; a quantitative approach was appropriate. Mogadishu was chosen as the study area as it is a fast-developing post-conflict city facing the growing challenges of informal settlements, strain on infrastructure, environmental degradation, lack of service provision, and institutional coordination.

3.2 Study Area

The study was carried out in the city of Mogadishu, Somalia, which is the country's largest urban, administrative, economic and political hub. Mogadishu has experienced rapid urban growth as a result of population growth, rural-urban migration, internal displacement, post-conflict reconstruction, and housing, infrastructure, transport, sanitation, waste management and public service needs. The above

circumstances make the city a relevant case to explore the impact of sustainability planning on urban outcomes in fragile and rapidly expanding urban settings.

3.3 Study Population

The target population included residents of Mogadishu, members of CSOs, NGO representatives and stakeholders engaged in urban development and service delivery in the city. Residents were included because they are the end users and experience the results of urban planning—service availability, infrastructure sufficiency, environmental quality, social inclusion, and livability. NGO and CSO representatives were involved due to their role in community development, urban service delivery, environmental management, settlement support and governance-related activities.

3.4 Sampling Technique and Sample Size

The sample employed in the study comprised 230 residents and 50 NGO/CSO representatives, making 280 respondents. This sample size was deemed to be sufficient for descriptive analysis, Relative Importance Index ranking, Pearson correlation and multiple regression analysis. Residents were selected using a stratified random sampling technique, which involved sampling people from various urban conditions, formal and informal settlement areas. This way of securing the representation of different neighborhood conditions and urban experiences. Moreover, purposive sampling was conducted for the selection of NGO and CSO representatives who had relevant knowledge and experience in urban sustainability, service delivery, community development and governance process in Mogadishu.

3.5 Data Collection Instrument

Structured questionnaire was used for the collection of primary data. The questionnaire aimed at assessing the respondents' perception of urban sustainability planning and urban outcomes. It was largely composed of items with fixed response options using a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree. The questionnaire was designed to assess four main constructs: environmental sustainability planning, social sustainability planning, institutional and governance capacity and urban outcomes. The study employed a structured questionnaire which was suitable for collecting the standardized responses appropriate to quantitative analysis.

3.6 Measurement of Variables

This study comprised three variables. Environmental sustainability planning was assessed with indicators measuring the consideration of the environment in urban development planning, waste management, traffic congestion, urban sprawl, green spaces, urban ecosystem and plans for managing population growth. Indicators of social sustainability planning included the presence of indicators on vulnerable groups, community participation, social inclusion, equity in access, housing, public services, infrastructure and social programs. Institutional and governance capacity was assessed based on institutional readiness, transparency, accountability, financial and human resources, inter-agency coordination and implementation capacity indicators.

3.7 Validity and Reliability

Academic supervisors and research experts reviewed the questionnaire and approved it for content. This process contributed to the finalization of the items to be clear, relevant, and congruent with the study objectives and conceptual framework. 20 respondents not in the final sample were used for a pilot test. Before data collection, the questionnaire items were evaluated for their clarity, relevance and consistency using the pilot test. The reliability was checked with Cronbach's Alpha, and the reliability of the internal consistency was acceptable when the obtained value was ≥ 0.70.

3.8 Data Collection Procedure

Before the data collection, respondents were given information regarding the purpose of the study and their rights as participants. The questionnaires were conducted in Mogadishu with selected residents, NGO representatives and CSO members. The researchers provided clarification of the questions and made sure that the response was voluntary. Fully completed questionnaires were examined for completeness, consistency and accuracy before the data coding and analysis.

3.9 Data Analysis

Collected data were coded, cleaned and analyzed using statistical software including SPSS and Excel. To answer the study objectives, descriptive and inferential statistical methods were used. Descriptive statistics were used to summarize the respondents' perception of environmental sustainability planning, social sustainability planning, and institutional and governance capacity; first, descriptive statistics such as means and standard deviations were used. Using mean values, the extent of agreement with each statement was determined and standard deviations provided information about the amount of variation in the respondents' opinions. Secondly the Relative Importance Index (RII) ranking was applied to determine the importance of each sustainability planning indicator. The RII was used to determine what was perceived as the most influential factors on urban sustainability outcomes. RII was calculated as:

$RII = \Sigma W / (A \times N)$

Where **W** represents the weight assigned to each response, **A** represents the highest possible weight on the Likert scale, and **N** represents the total number of respondents. Thirdly, to see how strong and/or in what direction the relationships are between environmental sustainability planning, social sustainability planning, institutional/governance capacity and urban outcomes, Pearson correlation analysis was used. A 0.01 level of significance was used. Fourth, multiple regression analysis was performed to identify the unique and joint contributions of environmental sustainability planning, social sustainability planning and institutional/governance capacity to urban outcomes. The regression model was defined as:

$UO = \beta_0 + \beta_1 ESP + \beta_2 SSP + \beta_3 IGC + \varepsilon$

Where:

UO = Urban Outcomes, ESP = Environmental Sustainability Planning, SSP = Social Sustainability Planning, IGC = Institutional and Governance Capacity, β_0 = constant term, β_1, β_2, β_3 = regression coefficients and ε

= error term. Using this model, the degree to which the three dimensions of sustainability planning explain the variation in urban outcomes in Mogadishu was assessed.

3.10 Ethical Considerations

The study was approved by the Research Ethics Committee of SIMAD University (Reference number: EC000234) on 15 December 2025. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki (2013). The procedures have been carried out between January 1 and May 31, 2026, with adherence to the approved standards. Before data collection, informed consent was obtained from all participants. Participation was voluntary, and respondents were told they could drop out of the study at any time without repercussions. Respondents' confidentiality and anonymity were maintained. There was no disclosure of any personal identifying information in the final report, and the data collected were utilized only for academic and research purposes.

4. RESULTS

The results of the empirical study on environmental sustainability planning, social sustainability planning, institutional and governance capacity, and their effects on urban outcomes in Mogadishu, Somalia, are presented and interpreted here. The data were analyzed using descriptive statistics, the Relative Importance Index (RII), Pearson correlation analysis, and multiple regression analysis.

4.1 Environmental Sustainability Planning

This section explores the level of consideration given to environmental sustainability planning in relation to the problems of rapid urban growth in Mogadishu, Somalia.

Table 4.1 Descriptive Statistics of Environmental Sustainability Planning

Statement	Mean	Std. Dev.	RII	Rank
Urban development plans in Mogadishu consider environmental sustainability.	3.68	1.29	0.74	2
Environmental planning addresses challenges such as traffic congestion, waste management, and urban sprawl.	3.63	1.40	0.73	4
Green spaces and urban ecosystems are included in city planning to reduce urban growth pressures.	3.67	1.28	0.73	3
Environmental sustainability strategies are effective in coping with population growth.	3.96	1.18	0.79	1

According to Table 1, the results show that planning for environmental sustainability in urban development in Mogadishu is moderately integrated into the urban development processes. The highest ranking RII (0.79) was found for environmental sustainability strategies for population growth, indicating

that, for many, environmental sustainability is a significant challenge impacting planning priorities. By contrast, planning interventions for traffic congestion, waste management and urban sprawl had the lowest score (RII = 0.73), indicating low levels of implementation and infrastructure management. Overall, the results indicate that the concept of environmental sustainability is acknowledged in urban planning, but the implementation of environmental sustainability is inconsistent across the various planning dimensions.

4.2 Social Sustainability Planning

This section assesses the role of social sustainability planning in inclusive urban development in Mogadishu, Somalia.

Table 4.2 Descriptive Statistics of Social Sustainability Planning

Statement	Mean	Std. Dev.	RII	Rank
Urban planning considers the needs of vulnerable groups, including women, youth, and persons with disabilities.	3.76	1.08	0.75	2
Local communities participate in the decision-making process over urban development projects.	3.69	1.15	0.74	3
Social sustainability planning contributes to lessening inequalities with housing, public services and infrastructure.	3.83	1.08	0.77	1
Social programs effectively promote community participation and inclusion.	3.59	1.21	0.72	4

The results show that social sustainability planning is moderately developed in the urban context of Mogadishu. Reduction of disparities in access to housing, public services and infrastructure had the highest ranking (RII = 0.77), suggesting a relatively strong focus on equity-oriented planning. Social programs with a focus on community participation and inclusion, however, were the lowest ranked (RII = 0.72), indicating that participatory planning mechanisms and community engagement are not yet well institutionalized. Overall, the findings show that the processes of urban planning are partially socially sustainable, but there are still some significant aspects that are missing in the context of inclusive governance and the participation of citizens.

4.3 Institutional and Governance Capacity

This section examines the role of institutional and governance capacity in implementing urban sustainability planning in Mogadishu, Somalia.

Table 4.3 Descriptive Statistics of Institutional and Governance Capacity

Statement	Mean	Std. Dev.	RII	Rank
Local government institutions are well-equipped to implement urban sustainability plans.	3.46	1.31	0.69	1
Urban planning decisions are transparent, accountable, and accessible to stakeholders.	2.95	1.05	0.59	4
Sufficient financial and human resources are available to execute sustainability projects effectively.	3.36	0.94	0.67	2
Inter-agency cooperation in the execution of the sustainability plans is efficient and well organized.	3.27	0.96	0.65	3

Findings show that institutional and governance capacity is the weakest of the three pillars of sustainability. Transparency, accountability and accessibility of stakeholders ranked the lowest (RII = 0.59), indicating significant governance gaps in urban planning processes. Moderate performance was seen in institutional readiness and the availability of resources; however, coordination between government agencies was limited. These results indicate that institutional fragmentation, lack of accountability and low level of coordination mechanisms hinder effective implementation of urban sustainability initiatives in Mogadishu.

4.4 Pearson Correlation Analysis

The Pearson correlation matrix below shows the relationships between environmental sustainability planning, social sustainability planning, institutional and governance capacity and urban outcomes in Mogadishu.

Table 4.4 Pearson Correlation Results

Variable	ESP	SSP	IGC	UO
Environmental Sustainability Planning (ESP)	1			
Social Sustainability Planning (SSP)	0.66**	1		
Institutional & Governance Capacity (IGC)	0.54**	0.59**	1	
Urban Outcomes (UO)	0.62**	0.58**	0.49**	1

Note: $p < 0.01$

The correlation findings show that there are positive and significant relationships between all the dimensions of sustainability planning and urban outcomes. The most robust relationship with urban outcomes is for environmental sustainability planning ($r = 0.62$, $p < 0.01$), followed by social sustainability planning ($r = 0.58$, $p < 0.01$) and institutional and governance capacity ($r = 0.49$, $p < 0.01$).

These findings indicate that improvements in the sustainability planning dimensions are linked to improved urban outcomes in Mogadishu.

4.5 Regression Analysis

A multiple regression model was run to examine how environmental sustainability planning, social sustainability planning, and institutional/governance capacity affect urban results combined.

Table **4.5 Regression Coefficients**

Predictor	B	Std. Error	Beta	t	Sig.
Constant	0.52	0.15	–	3.47	0.001
Environmental Sustainability	0.45	0.09	0.40	5.00	$p < 0.001$
Social Sustainability	0.36	0.08	0.33	4.50	$p < 0.001$
Institutional & Governance Capacity	0.28	0.07	0.26	4.00	$p < 0.001$

Model Summary

Model	R	R^2	Adjusted R^2	F	Sig.
1	0.81	0.66	0.64	62.3	$p < 0.001$

The regression outcomes show that the variance in the urban outcomes was explained by a combination of 66% of environmental sustainability planning, social sustainability planning, and institutional/governance capacity ($R^2 = 0.66$). The overall model of regression was statistically significant ($F = 62.3$, $p < 0.001$); that is, the independent variables as a whole make a difference in predicting outcomes in urban areas in the city of Mogadishu. Environmental sustainability planning ($\beta = 0.40$, $p < 0.001$), followed by social sustainability planning ($\beta = 0.33$, $p < 0.001$) and institutional and governance capacity ($\beta = 0.26$, $p < 0.001$), had the greatest positive influence on urban outcomes among the predictors. These results suggest that the betterment of sustainability planning dimensions has a significant impact on the improvement of urban development outcomes in Mogadishu.

5. DISCUSSION

This study shows that urban sustainability planning is an important factor influencing urban outcomes in Mogadishu, Somalia. Both environmental and social sustainability planning were positively related to urban outcomes, as well as institutional and governance capacity, showing that sustainable urban development in fragile and rapidly growing cities requires the integration of environmental, social, and governance aspects. This strengthens the earlier claims that sustainability in cities, in general, needs to be achieved through coordinated land-use planning, infrastructure development, environmental protection, social inclusion, and institutional effectiveness (Brodny & Tutak, 2025). Moreover, it also

shows that the outcomes in urban areas in Mogadishu are not only influenced by population growth but also by the effectiveness of institutional capacity, governance coordination, and sustainability planning.

Environmental sustainability planning was the best predictor of urbanization ($\beta = 0.40$, $p < 0.001$). This discovery indicates that population pressure, waste management, congestion, urban sprawl, and environmental protection are major concerns in the quality of urban development in Mogadishu. This aligns with existing research that has proposed that unmanaged urbanization is a factor in environmental degradation, congestion, the growth of informal settlements, and unequal access to services (Atkinson, 2024). This also reinforces the idea that environmental degradation is exacerbated in the absence of a well-designed infrastructure and regulatory system to manage rapid urbanization (Antonio et al., 2025). In Mogadishu, environmental planning must not be viewed as a secondary concern for the urban context but as a central component of livability, resilience, and accessibility of services.

The results also reveal that planning for social sustainability is positively and significantly associated with urban outcomes ($\beta = 0.33$, $p < 0.001$). This shows that inclusive urban development is linked to the importance of reducing inequality in access to housing, infrastructure, and public services. However, the relatively low position of community participation and inclusion programs indicates that participatory planning mechanisms are still not well institutionalized. This finding reinforces the view that sustainable urban development will not be possible without equity, community engagement, and inclusion of vulnerable groups, and forms the basis for adding this dimension to the research (Seifollahi-Aghmiuni et al., 2022). Social sustainability should be enhanced by participatory governance and inclusive planning processes in the context of Mogadishu, where displacement, informal settlements, and inequalities in services are major challenges.

Institutional and governance capacity was the least developed sustainability dimension and an important predictor of urban outcomes ($\beta = 0.26$, $p < 0.001$). The low score for transparency, accountability, and stakeholder accessibility shows that governance shortcomings remain one of the major constraints to the impact of sustainability planning in Mogadishu. This result is aligned with other studies in the literature that indicate that fragile urban contexts lack the necessary institutions, coordination, capacity, and enforcement mechanisms for sustainable urban development (Nor & Moge, 2024). This further corroborates the findings that informal settlement development and service delivery are strongly associated with weak land governance, lack of infrastructure, and poor institutional coordination (Bayuma & Abebe, 2024). Thus, better plans are not enough to achieve better outcomes in urban areas, as institutions need to be strengthened to implement, monitor, and coordinate sustainability interventions in Mogadishu.

The correlation results also validated the positive and significant relationships between all three dimensions of sustainability planning and urban outcomes. Social sustainability planning ($r = 0.58$, $p < 0.01$) and institutional/governance capacity ($r = 0.49$, $p < 0.01$) were the other two variables most highly correlated with environmental sustainability planning. This indicates that the situation in Mogadishu's urban areas is multifaceted and needs to be addressed in a multifaceted manner. Instead, integrated

planning processes are required, including environmental management, social inclusion, and institutional coordination of cities, to create positive urban planning outcomes. This finding aligns with the theoretical basis of the study, which suggests that Urban Growth Theory can be used to explain spatial development and urban pressure, and that Sustainable Development Theory can be used to explain the need for balancing environmental protection, social justice, and governance effectiveness (Giacomelli et al., 2025).

The regression results indicate that there is good empirical evidence that environmental, social, and institutional/governance capacity planning, taken together, explains a significant amount of the variance in urban outcomes. The model had an R-squared value of 0.66 and an adjusted R-squared of 0.64, which showed that the model had a high explanatory power for its urban outcomes. The overall regression model was statistically significant ($F = 62.3$, $p < 0.001$). This means that in Mogadishu, the components of environmental planning, social equity, and governance capacity cannot be considered in isolation, and that addressing all of them concurrently will have a significant positive impact on the results achieved in urban areas. This serves as a research gap in the study, suggesting that most studies conducted so far have focused on urban issues separately. This study aims to present an integrated empirical effort to understand the role of the planning dimensions of sustainability in the outcomes of urban planning.

Overall, the findings suggest that the reconstruction of Mogadishu is not only a matter of infrastructure. This must be complemented by integrated environmental planning, inclusive service provision, strengthening the municipality's institutions, transparency in decision-making processes, and citizen participation. This study contributes to the field of urban sustainability by considering the fragile urban context of the post-conflict situation with rapid urban growth, displacement, gaps in infrastructure, environmental exposure, and a fragile institutional framework. Addressing issues of coordinated land use regulation, climate-sensitive infrastructure, waste management, inclusive upgrading of informal settlements, and accountable governance of the city are key actions for policymakers, municipal authorities, development partners, and urban planners to improve urban outcomes in fragile urban contexts such as Mogadishu.

5.1 Practical and Policy Implications

The findings of this study indicate that sustainable urban development in Mogadishu requires integrated environmental planning, inclusive service delivery, and stronger institutional coordination. The study further suggests that improving governance transparency, accountability, and implementation capacity is essential for enhancing urban resilience and sustainability in rapidly growing post-conflict cities.

5.2 Limitations of the Study

This study was conducted in one city only, Mogadishu, Somalia, with findings that may not apply to other urban settings. The study also used a quantitative questionnaire based and self-reported, and this approach may not have been comprehensive enough to encompass deeper qualitative views on urban sustainability issues.

6. CONCLUSION

This study explored how environmental sustainability planning, social sustainability planning, and institutional and governance capacity affect urban outcomes in Mogadishu, Somalia. The results indicate that both environmental and social sustainability planning have positive and significant impacts on urban outcomes, with institutional and governance capacity being the least positive and least developed sustainability dimensions, but still an important predictor of urban outcomes. The study also showed that while more planning processes are recognizing sustainability in Mogadishu, there are significant issues related to waste management, congestion control, governance coordination, transparency, accountability, and community participation. These findings suggest continuing governance fragmentation, limited coordination, weak accountability, and poor implementation capacities, which affect effective planning for urban sustainability in Mogadishu.

Overall, the regression model accounted for 66% of the variance in urban outcomes, validating the idea that each dimension of sustainability planning improves livability, environmental quality, infrastructure, social inclusion, urban resilience, and service access. Thus, this study adds to the urban sustainability literature by offering a multi-faceted assessment of environmental, social, and governance aspects in a fragile and post-conflict urban setting. The overall conclusion of the study is that, for sustainable urban development to be realized in Mogadishu, coordinated land use planning, climate-responsive infrastructure, better transparency of governance, improved institutional coordination, and community engagement are important. The results can also offer valuable lessons for other African and post-conflict cities that are rapidly urbanizing, institutionally weak, and confront similar sustainability and governance issues.

7. RECOMMENDATIONS

To mitigate the strain of rapid urbanization in Mogadishu, municipal authorities should enhance environmental sustainability planning by improving waste management, congestion control, urban sprawl control, green spaces, and installing climate-sensitive infrastructure. Policymakers should also encourage inclusive urban planning through equitable access to housing, infrastructure, and public services, as well as more participatory and inclusive decision-making in cities and in the context of the provision of public services. As the lowest sustainability dimension, institutional and governance capacity should be given attention, and municipal authorities should focus on governance transparency, accountability, inter-agency coordination, and implementation efficiency. Institutional capacity and enforcement are crucial for sustainable planning.

Prioritize integrated planning and participatory approaches that integrate environmental management, social inclusion, infrastructure development, governance cooperation, and coordination to strengthen urban resilience and planning effectiveness through urban planning institutions. Development partners and international organizations must provide technical assistance, institutional capacity building, investment in climate-resilient infrastructure, and collaborative governance between government

institutions, NGOs, CSOs, and local communities to support sustainable development in urban areas. Further research should focus on other aspects, including economic sustainability, climate resilience, disaster risk management, smart urban governance, and informal settlements in Somalia and other fragile urban areas in Africa.

Declarations

Ethical Approval

The study was approved by the Research Ethics Committee of SIMAD University (Reference number: EC000234) on 15 December 2025. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki (2013). The procedures have been carried out between January 1 and May 31, 2026, with adherence to the approved standards. The corresponding author can provide the ethical approval letter upon request.

Consent to Participate

Informed consent was obtained from all the participants before they participated. They received clear information on the purpose, methodology and data management of the study. The Research Ethics Committee of the SIMAD University permitted the use of verbal consent. Confidentiality and anonymity of the participants were ensured, and they were free to withdraw at any time without any consequences.

Consent to publish

No applicable

Clinical Trial Number

Not applicable

Conflict of Interest Statement

The author declares no conflict of interest.

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Author Contribution

Abshir Abdulle Amei was responsible for the conceptualization of the study, literature review, methodology design, data collection, and data analysis. Ali Abdi Yusuf contributed to the interpretation of findings, editing, writing of the original draft, and manuscript preparation.

Data Availability

Data supporting the findings of this research can be obtained from the corresponding author (Ali Abdi Yusuf), upon reasonable request, taking into account confidentiality and ethical considerations.

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