The role of Strategic Urban Planning in Improving Sustainable Urban Development in the context of Takoradi, Ghana

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Abstract
The African continent acknowledges Ghana as a developing economy with great potential because it contains the second-largest population in West Africa while exporting substantial amounts of timber, gold and cocoa. There seems to be a shortage of research into methods for helping Ghana achieve its full potential as a developing economy. Research about Ghana's sustainable urban development demonstrates considerable potential to drive economic progress through job creation and business growth. This study investigated how strategic urban planning operates within sustainable urban development by examining Takoradi in Ghana.

A combination of purposive and snowball sampling informed the selection of the 296 target participants. The study population consisted of citizens and stakeholders from Takoradi, Ghana. Stakeholders who were invested in the city's growth included company owners community members as well as urban planners and government representatives. The researchers conducted data analysis using SPSS after completing data collection. The regression analysis demonstrated a substantial beneficial effect ($p=0.00$, $\beta=0.652$, $r2 = 0.446$) of strategic urban planning government policies on sustainable urban development. A substantial positive correlation ($p=0.00$, $\beta=0.668$, $r2 = 0.425$) between AAR and SUD emerged from the research findings with resource allocation and availability identified as crucial elements for sustainable urban development.

The findings demonstrated a positive correlation ($p=0.00$, $\beta=0.733$, $r2=0.537$) between community participation in the urban planning processes and sustainable urban development. The data demonstrated a strong positive correlation ($p=0.00$, $\beta=0.733$, $r2=0.537$) between sustainable urban development and economic parameters. The progress of sustainable urban development moves forward alongside economic factors including job creation and economic expansion. The research demonstrated that sustainable urban development shows a negative correlation with environmental factors as reflected by statistical measures $p=0.00$, $\beta= -0.313$, $r2 = 0.098$.

Keywords. Ghana; Takoradi; Urban development; Sustainability; Africa

1. Introduction

Recent attention towards sustainable urban development arises from increasing urban populations and the need to solve urbanisation-related challenges. The boundary separating urban and rural areas generates scholarly debate as demonstrated by Gilani et al. (2022). This divide between urban and rural regions is further reinforced by a discrepancy in technology infrastructure which has led to a digital divide (Gilani and Faccia, 2022; Gilani et al., 2023b; Gilani et al., 2024). A few studies have demonstrated that such discrepancy is further enhanced or possibly minimised by the leadership of a business, especially, during challenging periods like the COVID-19 pandemic era (Gilani et al., 2023a; Gilani et al., 2025; Sulthan et al., 2022). Additionally, cities promote economic growth and development but simultaneously create social and environmental challenges including inequality, pollution, and traffic-related problems. Cities must implement a strategic urban planning approach that evaluates long-term development impacts on environmental health, economic growth, and social dynamics to resolve these concerns.

Urban planning requires an interdisciplinary methodology that evaluates how different urban systems connect. Strategic urban planning creates a framework for integrated development approaches by coordinating multiple policies and urban development actions toward sustainable outcomes (Guarneri & Ramalho, 2023). The strategic urban planning approach can merge public transport with green spaces to enhance environmental quality and tackle social challenges such as access to public services. Various authors have stressed the importance of engaging communities in urban planning processes. Strategic urban planning creates opportunities for various stakeholders to participate in decision-making processes which includes residents and local businesses as well as governmental organisations (Guarneri & Ramalho, 2023).

Community involvement serves as the driver of sustainable development because it enables residents to identify regional challenges while simultaneously establishing accountability and ownership among them (Guarneri & Ramalho, 2023). Strategic urban planning efforts towards sustainable urban development remain hampered by persistent obstacles and constraints. Political indifference alongside restricted budgets and inadequate institutional capacity create barriers to strategic urban planning (de Macedo et al., 2022).

Recent global interest in sustainable urban development stems from the increasing urbanization of the world's population. The United Nations predicts that two-thirds of humanity will reside in urban regions by the year 2050. Cities need to increase their efforts to ensure adequate services, infrastructure and resources for a growing population. Government policies' role in sustainable urban development gains more recognition yet remains insufficiently studied concerning their specific impacts on sustainability outcomes within strategic urban planning contexts. Top-down planning strategies frequently ignore local community needs resulting in unsustainable development (Dinsa Negeri et al., 2023). Existing literature lacks an examination of how the distribution and availability of resources influence sustainable urban development. Resource constraints in cities of underdeveloped nations act as barriers to implementing sustainable urban development programs (Birendra et al., 2021). However, there is limited literature exploring sustainable urban development in regions like Ghana. Therefore, this study seeks to explore strategic planning in sustainable urban development in the context of Takoradi.

2. Literature Review

2.1 Overview of Takoradi

The Sekondi-Takoradi Metropolis lies between 4◦ 52′ 30″ N and 5◦ 04′ 00″ N latitude and 1◦ 37′ 00″ W and 1◦ 52′ 30″ W longitude. The Sekondi-Takoradi Metropolis shares boundaries with Wassa East District to the north and the Atlantic Ocean to the south while it extends to Shama District in the east and Ahanta West District in the west. The city spans approximately 191.7 square kilometres while functioning as the administrative hub for the western region. The expanding population shows that rural areas contain 3.9% of residents while 96.1% reside in urban locations (Dadzie-Paintsil & Mensah, 2022). The Metropolis experiences an equatorial climate with average yearly temperatures around 22 ◦C which tend to occur from January through March. There are two distinct modes to the rainfall pattern: The main rainy season begins in March and lasts until July followed by a secondary season that starts in August and finishes in November. The map of Sekondi-Takoradi is illustrated in Fig. 1.

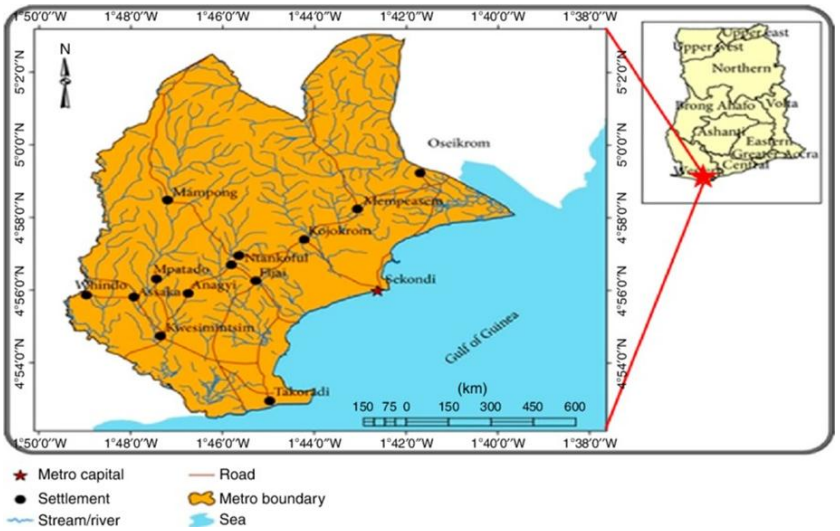


Fig. 1. Map of Sekondi- Takoradi Metropolitan Area.

As shown in Fig. 1, quite a significant boundary of Sekondi-Takoradi is shared with the sea. The discovery of oil in 2010 led to both population growth and real estate expansion within Ghana (Alqattan et al., 2019). The Sekondi-Takoradi spatial development planning unit examined environmental changes resulting from development pressures from 2010 to 2013. The studies conducted by Alqattan et al. (2019) provide essential insights into these developments. These developments create challenges for the city's sustainability because they oppose the objectives of SDG 11 which aims to produce inclusive and resilient cities by 2030 as set by the United Nations in 2015. The city has seen a significant increase in impermeable surfaces and urban development (Biney and Boakye, 2021).

2.2 Review of theories

Systems theory identifies the interconnected nature of system components while stressing the importance of seeing the entire system instead of individual elements. The method proves to be extremely useful when understanding complex phenomena such as ecological systems and human behaviour as well as organisational structures. Systems theory's reductionist approach represents one of its fundamental limitations. The theory shows connections between components but fails to accurately reflect the complexity of relationships within the system. The reductionist approach fails to account for the system's operational complexity which leads to restricted understanding. The application of Systems Theory to human and social systems reveals its weaknesses because individual and cultural factors significantly alter system behaviour (Checkland, 1999).

Institutional theory serves as a fundamental aspect of modern organizational studies that synthesizes concepts from political science, economics, sociology, and social psychology to analyze social activity processes as well as social order and cultural persistence. This approach examines institutional stability across different social levels from organisations to global systems and the functionality of institutional processes during change or conflicts between competing legal, cultural, and moral frameworks. Institutional theory demonstrates how social action functions within the boundaries established by rules and norms while being supported by typifications which help define cultural beliefs and scripts thus endowing social existence with meaning (Giddens, 1984). Research has shown that institutions play vital roles in establishing order while exerting influence across domains and organisational forms and shaping the hierarchies and identities of social actors. A recent study points out the concurrent role institutions play when interests, agency, and power combine to establish stability or dominance during transitional periods.

Critics have targeted the Institutional Theory for its shortcomings. The main criticism against the theory is that it overlooks how individual agency affects organizational behaviour (Burch, 2007). The perspective fails to recognize managerial and employee influence in organizational decisions and change because it focuses solely on institutional effects. Certain scholars argue that the theory gives less weight to power struggles and internal organisation conflicts while it places too much focus on institutional roles (Dorado, 2002). This study utilizes Institutional Theory to understand how institutional norms and values shape government policies as well as resource accessibility and community engagement while affecting economic variables and environmental concerns. Through analysis of institutional norms and values, this research sheds light on the factors driving the decision-making processes and sustainable development initiatives in Takoradi, Ghana.

Systems theory (Dorado, 2002) puts importance on the role of feedback loops and the dynamic nature of systems. Urban growth requires special attention because cities continuously evolve while facing new challenges. Identifying feedback loops between system components enables us to detect problems and adjust our strategies appropriately. Economic expansion in Takoradi which generates more job opportunities will likely lead to population growth and increased pressure on the city's resources. Applying systems thinking enables us to identify potential outcomes and address them.

2.3 Review of studies

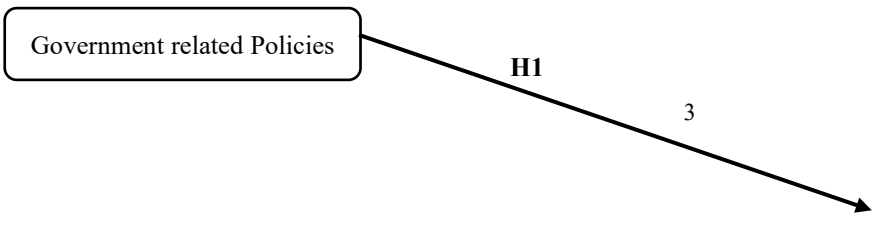
Alkhani (2020) examined the methods of sustainability and climate change delivery across Copenhagen and London, which are two major European cities with contrasting government structures and population sizes. The research focused on assessing how businesses contribute to climate change adaptation and mitigation while identifying their failures to fulfil climate action commitments. The analysis uncovered significant differences in how private sector involvement was governed and structured because Copenhagen and London differed in size and leadership for sustainable urban innovation. Cities established collaborative learning platforms to encourage voluntary private sector participation specifically for prototype urban projects.

The research revealed municipal government strategies can effectively track sustainability results in cities and urban projects by implementing ecological, circular and life-cycle methodologies while also promoting private sector participation. Alkhani (2020) provides important insights into how private sector involvement works for climate adaptation and mitigation projects in European cities. The paper fails to consider factors like community involvement and economic challenges which affect sustainable urban growth while focusing solely on two cities. The paper fails to address how government policies influence private sector involvement in sustainable urban development.

Angelidou et al. (2017) indicated smart and sustainable city environments exhibit substantial fragmentation across technical and policy dimensions where the authors discovered many unexamined opportunities for intelligent sustainable development. The findings showed uniformity across all types of urban environmental issues. The study limits our knowledge of the subject because it examines only applications and their outcomes instead of investigating why initiatives succeed or fail. After the review of the theory and literature, the following hypotheses have been developed.

H1: Strategic urban planning government policies drive sustainable development outcomes in urban settings.
H2: The proper distribution and accessibility of resources dedicated to urban development leads to beneficial outcomes in sustainable urban development.
H3: The involvement of communities and their active participation in urban planning processes leads to better outcomes for sustainable urban development.
H4: Sustainable urban development benefits from economic elements including growth rates and employment opportunities.
H5: The integration of environmental factors including green spaces and sustainability practices benefits sustainable urban development.

The literature review findings have also informed the conceptual framework illustrated in Fig. 2.



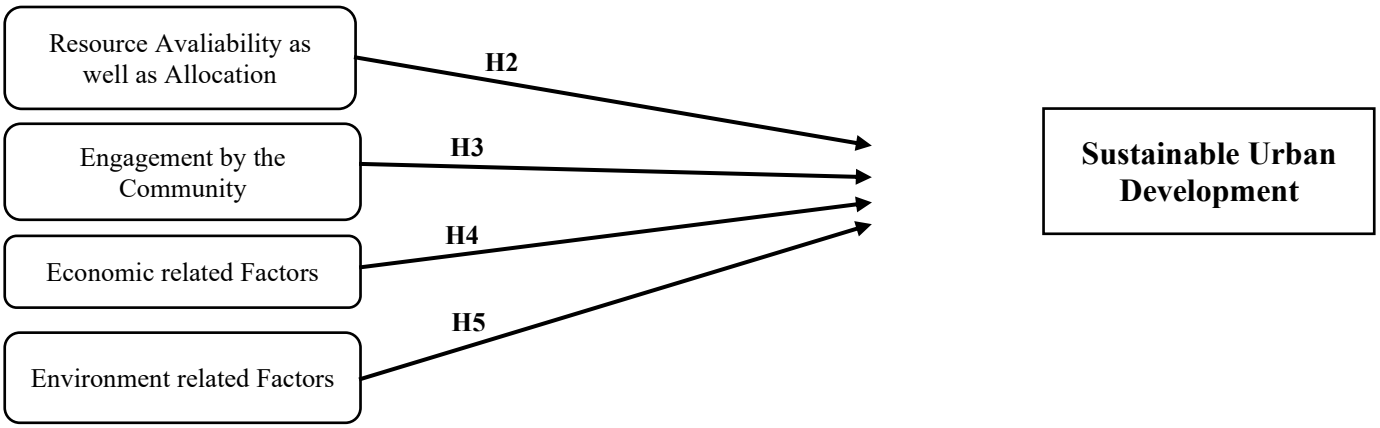


Fig. 2. Conceptual framework.

3. Research Methodology

This study involved a survey questionnaire with a 296 sample. The data was analysed through an SPSS analysis. The sampling was finalised through a purposive sampling strategy. Google Forms were adopted and distributed to participants via email, and WhatsApp. The participants provided responses on a 1-5 Likert scale for each question. The Data Protection Act 2018 and the University of the West of Scotland research guidelines (UK Government, 2024; University of West of Scotland, 2024) established the standards for obtaining participant consent and ensuring participant anonymity and data confidentiality.

4. Findings and Analysis

The correlation analysis reveals that age, gender, education level, occupation, years lived in Takoradi, household size, annual household income, homeowner/renter status and sustainable urban development aspects including government policies as well as resource availability and allocation along with community involvement and participation together with economic factors and environmental considerations exhibit interconnected relationships. The correlation analysis shows a positive correlation between age and the number of years spent living in Takoradi ($r=0.215$, $p<0.01$), which demonstrates that older individuals tend to have lived longer in Takoradi. Older residents appear to hold a deeper interest in their city's development. The data shows no meaningful connection between age and opinions regarding sustainable urban development because age does not demonstrate significant correlations with other examined variables. Gender showed no significant correlation with any of the categories which shows that views on sustainable urban development in Takoradi remain constant across gender lines. Higher education level individuals display increased awareness about resource allocation and tend to critique city resource distribution since resource availability and allocation show a weak correlation with education level ($r=-0.082$, $p<0.05$).

A descriptive analysis of multiple elements affecting urban growth in Takoradi. Researchers gathered data from 296 participants regarding their age, gender, and educational background alongside occupational duration in Takoradi and household information including size and yearly income as well as housing ownership status and their views on factors affecting urban growth. The calculated average age for the sample population stood at 2.79 alongside a standard deviation of 1.234 which indicates a wide distribution of ages. The distribution appears nearly normal according to its kurtosis score of -1.001 and skewness value of 0.122. The presence of a few outliers on both ends of the age spectrum shows that most of the sample group remains close to the mean age.

The findings reveal every one of the sample group's 296 members lives as either a homeowner or renter. The observed data shows consistency through both a standard deviation of 0.940 and a mean value of 2.44. The scores for kurtosis at -0.859 and skewness at 0.138 show that the data distribution approaches normality. The sample population displays positive attitudes towards government policies (GP), availability and allocation of resources (AAR), community involvement and participation (CIP), economic factors (EF), and sustainable urban development (SUD) based on the mean values ranging from 3.8716 to 4.1171. The data shows standard deviations between 0.59237 and 0.68375 which suggests varying perceptions exist among the sample population. The skewness and kurtosis values demonstrate that the data distribution for these variables is not regular because they exhibit extreme values across the spectrum. The regression analysis results are summarised in Table 1.

Table 1. Regression analysis

	Sustainable urban development
Independent var.	Model

		Beta	t	r	r^2	p-value	Durbin-Watson	F
H1	GP	.668	15.377	.668	.446	.000	1.561	236.445
H2	AAR	.652	14.747	.652	.425	.000	1.669	217.471
H3	CIP	.733	18.480	.537	.537	.000	1.515	341.500
H4	EF	.733	18.473	.733	.537	.000	1.781	341.246
H5	EC	-.313	-5.643	.313	.098	.000	1.224	31.847

a **Predictors**: (Constant) government policies (GP), availability and allocation of resources (AAR), community involvement and participation (CIP), economic factors (EF), environmental considerations (EC)
b **Dependent Variable**: sustainable urban development (SUD)

The analysis for H1 in Table 1 seeks to examine the effects of government policies on sustainable urban development. Government policies serve as the independent variable which includes various strategic urban planning measures established by governments. The connection between the independent variable GP and the dependent variable SUD can be measured through the beta coefficient or βeta. A beta coefficient of 0.668 demonstrates that SUD experiences a strong positive influence from GP. The implementation of each new GP leads to a 0.668-unit growth in SUD. To calculate the F-value we divide the mean square of regression which shows explained variance by the mean square of residuals which shows unexplained variance. The study verifies the accuracy of the model through its significant F-value measurement of 236.445.

For H2, the beta coefficient (βeta).652 shows a strong positive correlation between AAR and SUD. The high t-value of 14.747 demonstrates statistically significant evidence which supports this conclusion. The t-value reveals that sustainable urban growth depends more substantially on resource allocation and availability than on data error or variance. Resource distribution and availability explain 42.5% of sustainable urban development variation as indicated by a squared correlation coefficient of.425. The data shows that the model's fundamental assumptions remain intact while the residuals demonstrate no statistical correlation among themselves.

The connection between community participation in urban planning and sustainable urban development gets quantified through *H3* statistics. The research confirms that sustainable urban development (SUD) and community involvement and participation (CIP) demonstrate a substantial positive correlation of .537. The findings indicate sustainable urban development improves when community members participate more actively in urban planning processes. The beta coefficient of 0.733 shows a strong positive relationship between economic factors and sustainable urban development for H4. The growth of sustainable urban development is expected to rise alongside economic development factors like job creation and economic expansion. The positive relationship gains additional support from the t-value measurement which reached 18.473. The statistical value confirms that economic considerations have a significant and purposeful connection with sustainable urban development.

H5 reveals a negative relationship between environmental factors and sustainable urban development through a beta coefficient of -.313. The rise of environmental concerns leads to the reduction of sustainable urban development. Cities with higher levels of greenery may face difficulties in implementing sustainable development strategies. The significant t-score of -5.643 demonstrates that sustainable urban development and environmental problems are linked without random variation. The data strongly supports the hypothesis of a significant negative relationship between these two variables.

5. Discussion

The regression study results confirm that government strategic urban planning policies have a significant positive effect on sustainable urban development (p=0.00, β=0.652, r2 = 0.446). Government implementation of strategic urban planning policies proves necessary for sustainable development. The analysis demonstrates a strong positive correlation (p=0.00, β=0.668, r2 = 0.425) between AAR and SUD which shows that effective resource allocation and availability are essential for sustainable urban development. The necessity of strategic urban planning which integrates resource allocation and availability becomes clear to achieve sustainable growth objectives in urban areas. The findings support Cucoranu & Popescul (2023) who show a positive relationship between sustainable urban development and resource availability and allocation.

The analysis showed that community involvement in urban planning had a strong positive relationship with sustainable urban development (p=0.00, β=0.733, r2 = 0.537). This study arrives at conclusions which align with those put forward by Deep (2023) because they acknowledge the advantages that community involvement brings to sustainable development and urban planning. Research findings demonstrate a strong positive correlation between sustainable urban development and economic factors as evidenced by statistical results (p=0.00, β= 0.733, r2 = 0.537). Sustainable urban development advances in parallel with economic elements including employment opportunities and overall economic expansion. The study demonstrates that sustainable urban growth depends significantly on economic factors.

The findings demonstrate that economic factors and sustainable urban development share a worldwide relationship instead of being confined to specific regions. The analysis demonstrated a negative relationship between sustainable urban development and environmental factors with a p-value of 0.00, a coefficient of β= -0.313 and an r-squared value of 0.098. The research demonstrates agreement with Cucoranu and Popescul (2023) regarding urban areas with higher green space percentages showing better sustainable development through improved waste management performance and energy efficiency together with enhanced air quality.

6. Conclusion

This study examined how strategic urban planning affects sustainable urban development in Takoradi, Ghana. Research results show that economic considerations along with community involvement and resource availability together with government policies create positive impacts on sustainable urban growth. The study's findings demonstrate that environmental factors display a negative relationship with sustainable urban development which underscores the importance of integrating environmental factors into urban planning processes. The findings help expand the knowledge base surrounding sustainable urban planning and development. The importance of incorporating environmental variables into urban planning becomes more evident through the observed negative link between sustainable urban development and environmental considerations. The research results point to the necessity of adopting an integrated sustainable framework for urban planning while impacting urban development policies and practices.

6.1 Research Implications

These findings can guide both government bodies and urban planners to create impactful policies for sustainable urban growth. Governments need to establish legal frameworks that advance sustainable development while adopting strategic planning approaches for urban development. The development of urban planning policies by governments requires consideration of resource allocation and availability. Governments can promote sustainable urban development when they combine urban planning with essential factors like resource distribution, community participation, economic development and environmental protection. From the findings of the study, strategic planning stands out as the essential element of urban planning. The development of sustainable urban areas receives strong support through government policies that focus on strategic planning alongside multiple sustainability considerations.

6.2 Recommendation

Based on the key findings, the authors highly recommend a drive for the adoption of innovative technologies by businesses which has proven to be effective in ensuring the growth and survival of businesses in past studies involving businesses from other sectors (Al Jaghoub et al., 2024; Gernal et al., 2024; Moussa et al., 2024). Additionally, previous studies have highlighted the role of peoples' attitudes and regional/business culture in influencing the adoption of innovative practices which may apply to businesses in this research (Aseer et al., 2024; Krupicka et al., 2024). Finally, the authors recommend that the businesses from this research consider partnerships with educational institutions where such partnerships have been proven to be beneficial for both higher education and industrial businesses in past studies (Yasin and Gilani, 2022; Yasin et al., 2023)

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