



## Regular Article

## Indicator-based assessment of the liveability of communities in the Accra Metropolitan Area, Ghana: A transdisciplinary approach

Alex Barimah Owusu<sup>a</sup>, Collins Adjei Mensah<sup>b</sup>, Iris Ekuia Mensimah Fynn<sup>a</sup>, Clement Kwang<sup>a</sup>, Isaac Kwamena Arthur<sup>a</sup>, Kofi Adu-Boahen<sup>c,\*</sup>

<sup>a</sup> Department of Geography and Resource Development, University of Ghana, Legon, Ghana

<sup>b</sup> Department of Geography and Regional Planning, University of Cape Coast, Ghana

<sup>c</sup> Department of Geography Education, University of Education, Winneba, Ghana

## ARTICLE INFO

## Keywords:

Liveability  
Indicator-based assessment  
Accra metropolitan area  
Transdisciplinary approach

## ABSTRACT

Local knowledge of spatiotemporal patterns of liveability is vital for choosing where to live and where revitalisation efforts must concentrate. We employed transdisciplinary learning to identify 12 liveability indicators and applied them to assess the liveability of 81 communities of Accra, Ghana. The results show that crime and rent are the top two most important liveability indicators. The least three indicators are the availability of jobs, entertainment, and flood susceptibility. Out of 81 communities grouped into five quantiles, ten fell in the 1st quantile (most liveable), 24 communities were in the 2nd quantile, 3rd had 24, 4th 17, and 5th nine communities respectively as least liveable. 1st quantile communities are mainly high-income communities, while 5th quantile communities are mainly middle-income communities that have become commercial areas. Not surprisingly, high-income communities like the Airport residential area, East Legon, and Dzorwolu all fall into the 2nd quantile as all these communities are gradually turning into mixed commercial and residential places. The study indicates that low-income communities lack social amenities and resources, which can be attributed to a lack of state social intervention policies. This may mean local administration systems (district assemblies) failing as Ghana's development agents.

### 1. Introduction

Globally, we now live in an urbanised world since most of the world's population live in urban areas. Current statistics show that about 57% of the world's population now live in urban areas, and by 2050 urban population will increase to 68% (United Nations, 2022). Future projections indicate that Africa and Asia will account for about 90% of the urban population growth within the next three decades (United Nations, 2019). This trend began in 2007 when more people lived in urban areas than rural areas for the first time. This development has made urban areas and cities an integral part of the global economy, providing social and economic opportunities to support the well-being of millions of urban dwellers (Mori & Christodoulou, 2012). The global urban population was 34% of the total in 1960; however, by 2014, the urban population accounted for 54% of the total and is still growing. The proportion of people living in cities is predicted to reach 66% by 2050 (United Nations Department Economics and Social Affairs

(UNDESA), 2014). The urbanisation trends are partly due to employment opportunities and economic opportunities which are often accessible in urban areas. In the social realm, there is easy access to education, healthcare, water, electricity, and transport services in urban areas and better housing and sanitation systems (UNDESA, 2014). A further emphasis on the benefits of urbanisation by the Asian Development Bank (2019) revealed that rapid urbanisation of the world from 1950 to the present had stimulated growth and innovations in many urban areas to make them engines of economic growth and prosperity. These have been possible through urban agglomeration and economies of scale generated by urbanisation.

Notwithstanding the prospects of urbanisation, some challenges exist. Rapid urbanisation has made urban areas hotspots for high consumption of energy, generation of high volumes of waste, and production of many water and air pollutants (Tennakoon & Kulatunga, 2019). Similarly, Peris-Ortiz, Bennett, and Yábar (2017) found that a rapidly urbanising environment has been associated with a high crime rate,

\* Corresponding author.

E-mail addresses: [abowusu@ug.edu.gh](mailto:abowusu@ug.edu.gh) (A.B. Owusu), [cmensah@ucc.edu.gh](mailto:cmensah@ucc.edu.gh) (C.A. Mensah), [iemfynn@ug.edu.gh](mailto:iemfynn@ug.edu.gh) (I.E. Mensimah Fynn), [ckwang@ug.edu.gh](mailto:ckwang@ug.edu.gh) (C. Kwang), [ikarthur@ug.edu.gh](mailto:ikarthur@ug.edu.gh) (I.K. Arthur), [kadu-boahen@uew.edu.gh](mailto:kadu-boahen@uew.edu.gh) (K. Adu-Boahen).

<https://doi.org/10.1016/j.ssaho.2023.100702>

Received 6 July 2023; Received in revised form 7 August 2023; Accepted 2 October 2023

Available online 17 October 2023

2590-2911/© 2023 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

traffic congestion, pressure on social amenities, and uncontrolled development. Other challenges of urbanisation found in the literature include loss of nature, habitat fragmentation and loss of biodiversity (Güneralp & Seto, 2013; McDonald et al., 2020) and loss of agricultural lands (d'Amour, 2017; Pandey & Seto, 2015) and higher urban greenhouse gas emissions per capita (Mahtta et al., 2022).

In Africa, the challenges of urbanisation are so severe that they require urgent attention. A recent study by Madden and Gutman (2020) revealed the following findings. Low public and private investments in housing and other social infrastructure, inadequate structural transformation, and poor land management practices have resulted in limited access to jobs and other essential services. These have led to a high cost of living for African urban dwellers. Another study found that Africa's urban inhabitants pay 55% more for housing and 42% higher for transport than in other regions of the world (OECD/UN ECA/AfDB, 2022; Dodman, Leck, Rusca, & Colenbrander, 2017). In addition, a study on 48 countries in Sub-Saharan Africa found a positive relationship between urbanisation and income inequalities in the sub-region, indicating a large gap between the urban poor and the rich (Sulemana, Nketiah-Amponsah, Codjoe, & Nyarko Andoh, 2019).

The urbanisation situation in Ghana is not different from that of Africa. With the country's urban population at 56.7%, Ghana is one of the highest urbanised counties in Africa (Ghana Statistical Service, 2021; Statista, 2023). Across Ghana, the Greater Accra Region, which hosts the country's administrative and commercial capital (Accra), is the most urbanised of the 16 regions. Accra is recognised as the most urbanised city. Inadvertent physical development, expansion in hazardous floodplains and wetland environments, inefficient and inadequate drainage systems, and poor solid management practices all trigger perennial flooding during prolonged rainfall (Amoako & Frimpong Boamah, 2015). The city's rapidly increasing population and associated high housing deficits (about 300,000 units) have caused thousands of its residents to live in informal settlements. Informal residences are estimated to host about 58% of the city's total population of Accra (Acheampong, 2021). Issues of poor access to essential services such as portable water and toilet facilities and heavy traffic congestion remain prevalent. The landscape of Accra is characterised by high attrition of renters and even landlords and landladies. People move many times in their search for communities where living conditions are manageable or they may consider liveable. Therefore, there is an urgent call for attention to improving the living conditions of urban areas in Ghana (especially Accra, the country's capital city) and Africa to make them liveable for urbanites and future immigrants.

Liveable or liveability as used here connotes a comfortable urban space where one can live, work, and enjoy physical infrastructure (urban facilities), non-physical (relationships) aspects, social and economic activities (Sasanpour, Simin, & Hamza, 2015). Over the past decade, some initiatives have been embarked upon by the Ghana government in collaboration with the Accra City Authorities to improve living conditions in Accra, such as "making Accra the cleanest city in Africa", "Accra Greening and Beautification Project" and "Accra Must Work Again project", operation clean your frontage etc. However, there is little to show regarding progress towards liveable communities (Akmar, Hersperger, Kabisch, Mensah, Wang & Douglas 2021). This calls for an alternative approach from government-led, politically and project-based liveable city initiatives to continuous and participatory citizen-based ones. Already there is a pursuit of an indicator-based system framed on local conditions to frequently monitor and improve living conditions of urban areas in Ghana through local authorities in collaboration with the citizens, but this remains a grey area of systematic research. This study was conducted against this backdrop. This study sought to arrive at local-based urban liveability indices and apply them to develop a composite assessment of the liveability of the communities in Accra using a transdisciplinary approach. The novelty of this study is that it adopts a shared learning approach to build a standard measuring approach that can be replicated and used to establish a community

liveability league table for comparing communities in Accra and Ghana as a whole. This may be the first of its kind in Ghana, where based on accumulated scores of variables captured, multiplied by factor weight, communities may be ranked based on residents' perception of liveability. This will help inform the decisions on where to live (rent or build) in Accra to improve their quality of life. It will also go a long way to enhance property values and influence citizens' participation in making communities liveable. Residents of communities that are not performing well on the league table will make the necessary efforts to make their communities more liveable. This is different from the already well-established global liveability indexes, such as the Economic Intelligence Unit's Liveability Index and the Quality of Living Index by Mercer, that are based on their intended purposes (Tennakoon & Kulatunga, 2019) without paying particular attention to different cultural and local conditions prevailing in individual communities within cities such as Accra.

## 2. The concept of liveability and liveable cities

Liveability concerns individuals' present and immediate needs to live comfortably in a given area. It differs from sustainability which deals with the overall long-term well-being of humans and the earth (Baobeid, Koç, & Al-Ghamdi, 2021). However, there is no globally accepted definition for the term liveability, as it is used in a wide array of fields, especially in the context of urban planning fields, such as community development, transportation and resilience. Efforts to define liveability have resulted in various definitions in the literature. According to the American Association of Retired Persons (AARP, 2011, p. 24), "a liveable community is safe and secure, has affordable and appropriate housing and transportation options, and offers supportive community features and services". In this definition, emphasis is given to critical variables such security, housing, and personal independence (Tennakoon & Kulatunga, 2019). In another breadth, Lowe et al. (2013) defined a liveable neighbourhood as attractive, safe, inclusive, socially cohesive and generally environmentally sustainable, with easy access to affordable housing, education, public open spaces, health and community services.

Similarly, the 2013 Australian City Report classified liveable cities with the following characteristics: being healthy, safe, attractive, affordable, having good accessibility to urban services and being environmentally sustainable (Major Cities Report, 2013). It can be deduced from these definitions that liveability is about having a good quality of life with much emphasis given to features such as health, housing, safety, security and environmental sustainability. The challenge is how to measure the quality of life universally. Quality of life indicators may be context-specific and vary from culture to culture.

The above conceptualisation of liveable communities shows that various factors or indicators come into play when assessing a place's liveability. These factors can broadly be classified into two: objective and subjective factors. Whilst the objective factors measure and quantify the factors in numbers (such as the cost of housing; the number of schools, hospitals; level of crime etc.), the subjective factors focus on people's feelings, emotions and spiritual attachment that cannot easily be quantified (Carmona, 2019, Breiner, Ford, & Gadsden, 2016). Several liveable city indices have been developed based on these broad indicators or factors. The Global Power City Index (Mori Memorial Foundation, 2011), the EIU Liveability Index, and the Quality of Living Index (Mercer, 2011) are popular indices for measuring community liveability. Although these indices provide good benchmarks for measuring liveability, some differences exist among them based on the different purposes they were designed to achieve and the culture within which they were developed. Whilst the Quality of Living Index by Mercer assesses the liveability of communities to aid foreign employees, the Economist Intelligent Unit's Liveability Index measures the liveability of cities to check their suitability for investments (Tennakoon & Kulatunga, 2019). On the other hand, the Global Power City Index

measures the liveability of different regions and makes necessary comparisons to influence policy development. The vital determinant indicators for liveability emphasised by these indices include stability, housing, education, healthcare, culture, environment and infrastructure, and all of these were developed in the Western culture (Capitiano, 2017; EU, 2018; Holden, 2012).

Due to cultural differences and peculiarities of living conditions in one's community, using globally recognised liveability indexes to measure liveability in a specific neighbourhood may not thoroughly reflect living conditions in that area. It is worth understanding that applying established global methodology is helpful for acceptance, comparison and efficiency. However, including variables may have to reflect local aspirations and culture. Because of this, using the present living conditions of Accra, 12-point liveability indicators were locally identified and mapped for this assessment. These indicators covered the following: crime prevalence, rent cost, food cost, traffic congestion, availability of jobs, distance to work, availability of public transport, availability of entertainment, flood susceptibility, type of income community, opportunities the community offer and sanitation situation. They were arrived at using transdisciplinary learning, assembling expert consultation and residents with local knowledge. The identified indicators broadly combine objective and subjective parameters for this liveability assessment.

### 3. Materials and methods

#### 3.1. Study area

This paper is part of a more considerable scoping study conducted in the Greater Accra Metropolitan Area (GAMA), Ghana. However, this publication focuses on the liveability of communities within the Accra Metropolitan Area (AMA). The study is based on the 2016 administrative boundary of AMA and encompasses 81 communities within AMA; see Table 1 and Fig. 1.

AMA is the National Capital and the largest city in the Greater Accra Region, with a population of around 2,557,000 in 2021 (Ghana Statistical Service, 2021). It is home to Ghana's only international airport, Kotoka International Airport. It acts as the country's commercial core. For these functions, AMA is the initial and last point of contact for all international business travelers and residents that enter and exit Ghana. AMA serves as Ghana's administrative, economic, and educational capital. The city is home to the headquarters of all the central banks and trade enterprises, insurance companies, the energy corporation, the

general post office, the enormous open markets from which the majority of the food supply in the nation is sourced, and the Accra Central Library. AMA is a contemporary city with some of Ghana's best hotels, beaches, and public spaces, attracting many tourists. Because of the high level of business, commerce, education, and related activities, demand for land is exceptionally high, resulting in conflicting uses and, as a result, high living costs. Fig. 1 depicts the AMA's boundary and villages as determined by the Ghana Statistical Service (GSS) in 2016.

As represented in Fig. 1, AMA contains 81 smaller communities of no specific definition; however, they are well-known by the residents. The communities range from very high-income residential areas like East Legon, Airport Residential Area, Cantonments, and Dzorwulu, through middle-income communities like Roman Ridge, Labone, Kanda, and Tesano and to low-income and poorly organised Zongo communities, such as Nima, Maamobi, Old and New Fadama and Chorkor. The wide array of communities epitomises the diversity and inclusive nature of communities in AMA. Although AMA classifies communities as high, middle, and low-income based on types of buildings, spatial arrangement of buildings, surroundings, and quality of living, it is not uncommon to find a dilapidated and poorly structured building within high-income communities and vice versa.

#### 3.2. Study method

##### 3.2.1. Study design

This study was a realist evaluation with an embedded longitudinal case study of AMA, where a transdisciplinary research approach was employed. Case study methodology seeks to generate deep and multi-faceted understandings of an issue in a real-life context (Crowe et al., 2011) at times for theory-building (George & Bennett, 2005) and, as such, is well aligned with the real-life, pragmatic orientation of realist evaluation (Pawson, 2013; Rycroft-Malone et al., 2013).

##### 3.2.2. Study context

This study is part of a more extensive study titled urban resilience in Africa, particularly on land use stresses in an urban environment in the Greater Accra Metropolitan Area (GAMA), Ghana. In this broader study, Metropolitan, and Municipal areas and their communities were assessed. In this paper, we report on the part of the assessment relating to the Accra metropolitan area (AMA) only. AMA is one of the 25 metropolitan and Municipal areas that form GAMA. The study adopted a transdisciplinary research approach to produce knowledge that is intellectually stimulating and locally verifiable (Vermeulen & Witjes,

**Table 1**  
All 81 communities in Accra Metropolitan studied.

Abeka	Darkuman	Lapaz	Old Tesano
Abelenkpe	Dzorwulu	Lartebikorshie	Osu
Abofu	East Legon	Mamobi	Ringway Estate
Abossey-Okai	East Legon Extension	Mamponse	Roman Ridge
Accra Central	Gbegbeyise	Mamprobi	Russia
Achimota College	James Town	Mateheko	Sabon Zongo
Adabrka	Kanda	Ministerial Area	Sempe
Airport	Kanashie	Mpoase	South Industrial Area
Airport Residential	Kisseman	New Fadama	South Industrial Area
Airport West Residential	Kokomlemle	New Town	South Labadi
Akweteyman	Korle	Nima	South Legon
Alajo	Korle Dudor	North Alajo	South Odorkor
Alogboshie	Korle Gonno	North Dzorwulu	Sukura
Asylum Down	Korle-Bu	North Industrial Area	Tesano
Avenor	Kotobabi	North Kanashie	Tudu
Awudome	Kpehe	North Kanashie	University of Ghana
Bubuashie	Kwashiman	North Odorkor	Ussher Town
Burma Camp	La	North Ridge	West Abossey-Okai
Cantonments	La Dadekotopon	Nyaniba Estate	West Ridge
Chorkor	Labone	Old Mamprobi	Zoti
Dansoman			

Source: Field data (2022)

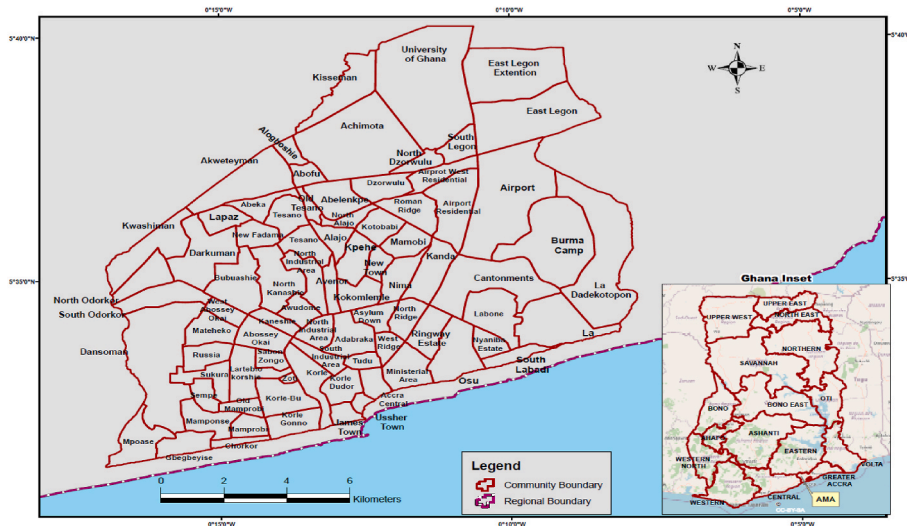


Fig. 1. Map of Accra Metropolitan Area (Ghana) showing study communities in the national and regional context. Source: Authors' Construct (2023).

2020; Tress, Tress, & Fry., 2005). Transdisciplinary research, according to Pohl (2011 pp. 625) is defined as “framing, analysing, and processing an issue such as (1) the issue’s complexity is grasped (2) the diverse perspectives on the issue are taken into account, (3) abstract and case-specific knowledge are linked and (4) common-good-oriented descriptive, normative, and practical knowledge to address the issue is developed”. Adopting a transdisciplinary research approach allowed the study to integrate knowledge across academic disciplines with non-academic stakeholders, who are locally knowledgeable to address this problem of urban resilience but also offered participants the opportunity to assess liveable communities from their local community knowledge, understanding, and perception of each community under the study. Table 2 provides information about the participants to help us understand the diversity and depth of backgrounds to generate the primary data.

3.2.3. Sample and sampling

Participants of the transdisciplinary study, who were involved in a two days stakeholders’ workshop meeting involving 25 participants organised for the purpose of transdisciplinary data generation and analysis, were purposively selected. The participants comprised six (6) experts selected from six (6) fields of specialisation and 19 working community members with varying backgrounds, residing and working for various institutions and organisations. Table 2 provides details on participants of the transdisciplinary learning participants. The transdisciplinary study participants were between 20 and 60 years old. The study was with the assumption that age and sex affect the perception of a community’s liveability. These respondents were considered knowledgeable in the subject matter and are, therefore, in a position to provide detailed information on AMA to ensure a successful study.

3.2.4. Data and sources

Both primary and secondary data were used. Using interview guide, observation checklist, document review, visual appraisal, and analyses of maps/satellite imagery drawn from the research area as data sources, primary data were obtained from participants during a two-day workshop spanning three rounds of indicator selection, validation and expert ranking, community-indicator ranking and matching and community liveability assessment, mapping and validation. The secondary data were published and unpublished works, including liveability indicators, GIS data (community boundary) from the rsgislab.uq.edu.au, the University of Ghana, statistics, and literature. The transdisciplinary approach generated primary data, mainly community liveability

indicators and indicator ranking.

3.2.5. Data collection and analysis

Document review, narrative data from semi-structured interviews, visual data from participant-elicited drawings, and observation and reflection were used to collect data. Data were collected across three rounds of indicator selection, validation and expert ranking, community-indicator ranking and matching and community liveability assessment, mapping and validation at the University of Ghana, Department of Geography and Resource Development during the two days program. The study adopted three stage process for generating the data. The first stage of the process was the selection of the applicable liveability indicators and expert ranking of the selected indicators on a Likert scale of 1–5. Stage two (2) is the community indicator score. In stage three (3), the community liveability maps were created and validated by the participants. Participants independently selected each indicator and scored each community for that indicator. Participants agreed on 12 liveability indicators and ranked them. The statistical treatment of the data analysis is stated as follows:

(IS) Indicator Score = an average score from participants

$$\omega_{kj} = \frac{\sum_{j=1}^K k_{ij} f_{ij}^e}{\sum_{j=1}^k k_j \sum_{i=1}^e f_i} \tag{Equation 1}$$

$\omega_{kj}$  refers to the IS,  $f_{ij}^e$  is the  $i$ th frequency of  $j$ th parameter in  $e$  total expert sample,  $k_{ij}$  is the ranking of the  $j$ th parameter by the  $i$ th respondent, and  $K$  is the total number of ranked parameters.

Community Indicator liveability Score = IS (average score from all participants)

$$\varphi_{kj} = \left( \frac{\sum_{j=1}^K k_{ij} f_{ij}^e}{\sum_{j=1}^k k_j \sum_{i=1}^e f_i} \right) \left( \frac{\sum_{j=1}^K k_{ij} f_{ij}^n}{\sum_{j=1}^k k_j \sum_{i=1}^e f_i} \right) = \omega_{kj} = \frac{\sum_{j=1}^K k_{ij} f_{ij}^n}{\sum_{j=1}^k k_j \sum_{i=1}^e f_i} \tag{Equation 2}$$

$\varphi_{kj}$  is the Community Indicator Livability Score,  $f_{ij}^n$  is the  $i$ th community frequency in  $N$  total community-level sample.

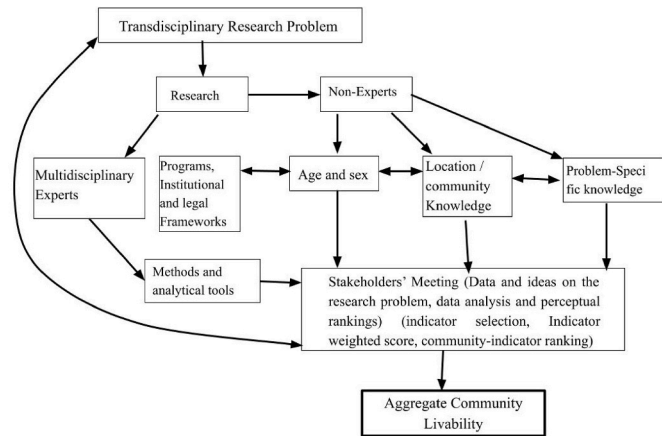
Total liveability score = average score of all community liveability indicators

**Table 2**

Summaries of the composition of the workshop participants. The demographic composition was based on sex, organisation of work, area of specialisation and age.

Participant ID	Organisation of Work	Area of Specialisation	Sex	Age
1	University of Ghana	GIS and Spatial Planning	M	50+
2	University of Ghana	Urban and Development Planning	M	Upper 40s
3	University of Ghana	Gender and Development	F	50+
4	University of Ghana	Medical Geography	M	50+
5	National Development Planning Commission	Policy Expert	F	30+
6	University of Ghana	Development Planning	F	Upper 40s
7	University of Ghana	Project and Applied Management Specialist	M	50+
8	Zoomlion Ghana Limited	Waste Management Specialist	M	50+
9	National Development Planning Commission	Project Management and Policy Expert	M	Mid 40s
10	Ablekuma West Municipal Assembly	Development Planning	F	30+
11	Friends of the Earth (NGO)	Environmental Specialist	M	Upper 40s
12	Ga Traditional Council	Traditional Leader/Herbalist	M	60+
13	Adentan Municipal Area	Community Task Force and Advocacy	M	Mid 40s
14	Social Welfare Market Women Association	Trading	F	Upper 40s
15	Accra Metropolitan Assembly	Planning	F	Mid 40s
16	Accra Metropolitan Assembly	Spatial Planning	M	Mid 40s
17	Accra Metropolitan Assembly	Environmental Management	M	30+
18	Environment Protection Agency	Environmental Protection Analyst	M	Mid 40s
19	University of Ghana	Geography/Private Business Practice	F	30+
20	Land Use and Spatial Planning Authority	Spatial Planning	M	30+
21	National Service Scheme/University of Ghana	Geography	F	20+
22	National Service Scheme/University of Ghana	Geography	F	20+
23	University of Ghana	Organisational Leadership and Governance	F	Upper 40s
24	Ghana Real Estate Developers Association	Administration	M	Mid 40s
25	University of Ghana	Urban Geography	M	50+

Source: Field data (2022)



**Fig. 2.** Transdisciplinary Study Approach, which guided data collection and analysis to ensure a participatory process.

Source: Authors' Construct (2022).

$$\tau = \frac{1}{K} \sum_{j=1}^K \left( \frac{\sum_{i=1}^k k_{ij} f_{ij}^e}{\sum_{i=1}^k k_j \sum_{i=1}^e f_i} \right) \left( \frac{\sum_{i=1}^k k_{ij} f_{ij}^n}{\sum_{i=1}^k k_j \sum_{i=1}^e f_i} \right) = \frac{1}{K} \sum_{j=1}^k \varpi_{k_j} \left( \frac{\sum_{i=1}^k k_{ij} f_{ij}^n}{\sum_{i=1}^k k_j \sum_{i=1}^e f_i} \right)$$

$$= \frac{1}{K} \sum_{j=1}^K \varphi_{k_j}$$

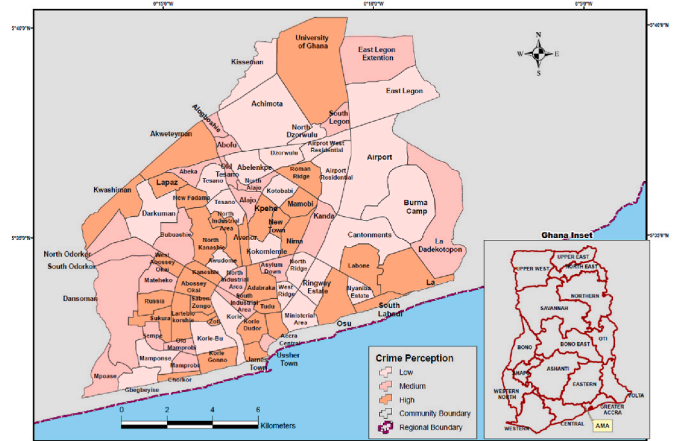
Equation 3

$\tau$  is the total liveability score.

Fig. 2 is the conceptual model for the Transdisciplinary Research Workflow explaining how the research output was generated. The data generated were based on the instruments made available by the researchers.

**3.3. Limitations of the study**

This study uses methods and data based on residents' observation, experiences and perceptions for assessing livability in a way that is



**Fig. 3a.** Locals' perceived crime rate for Accra Metropolitan Area.

completely different from the traditionally acceptable assessment such as the Global Power City Index (Mori Memorial Foundation, 2011), the EIU Liveability Index, and the Quality of Living Index (Mercer, 2011). Perhaps, the biggest limitation is the selection of the participants and the subjective nature of the views the expressed. However, it is important to know that the existing traditionally known assessments, reviews from country's point of view and also at different socio-economic meliux, whiles this study assesses livability from the perspective is smaller community where no one compiles routine data. Interestingly the participants are diverse and have lived and worked within the communities for not less than 5 years, which by and large, authenticates their observations, experiences and opinions. The above conceptualisation of liveable communities shows that various factors or indicators come into play when assessing a place's livability. Studies have classified liveability indicators into objective and subjective factors. The objective factors measure and quantify the factors in numbers, including the cost of housing; the number of schools, and hospitals; the level of crime etc. whiles the subjective factors focus on people's feelings, emotions and spiritual attachment that cannot easily be quantified (Carmona, 2019,

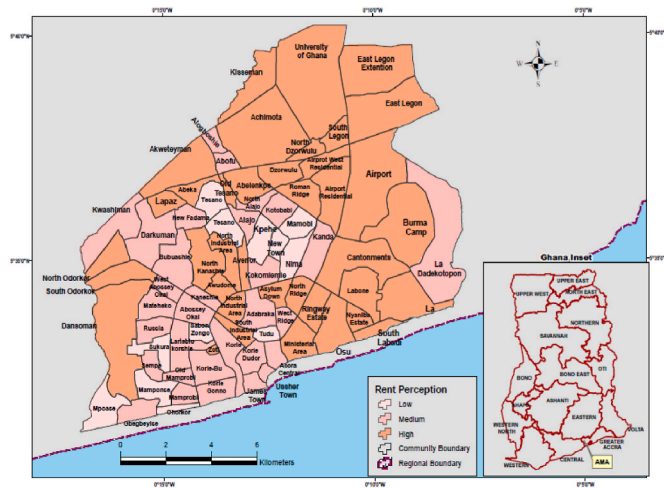


Fig. 3b. Locals' perceived levels of rent for communities in Accra Metropolitan Area.

Source: Authors' Construct (2023).

Table 3

List of Indicators and their weighted score.

S/N	Indicator	Weighted Score
1	Crime prevalence	0.25
2	Rent cost	0.13
3	Food Cost	0.09
4	Availability of Public Transport	0.08
4	Traffic Congestion	0.08
5	Distance to Work	0.07
6	Sanitation Situation	0.06
6	Type Income Community	0.06
7	Opportunities the community offer	0.05
8	Availability of Jobs	0.03
9	Availability of Entertainment	0.01
9	Flood Susceptibility	0.01

Source: Field data (2022)

Breiner et al., 2016). The consistency of indicators used in this study with other broad indicators that others have identified and used, gives value to this study. Cities and communities in the global south and Africa are likely to benefit extensively from this study's methodology and findings.

#### 4. Results

Based on expert-based and local knowledge-based indicators ranking the liveability of the communities and the perception of the local community members, the weightiest, constituting the most prominent socio-economic and ecological indicator of liveability in the study area, is crime. With a weight of 0.25, crime is considered the most crucial contributor to liveability. This is followed by rent weighted at 0.13 and then by the cost of food at 0.09 (Fig. 3 shows the top two indicators). The lowest-ranked socio-economic and ecological liveability indicators are Entertainment, Jobs, live time Opportunities, and Sanitation in descending order at 0.01, 0.03, 0.05, and 0.06, respectively. While access to Public Transportation and Traffic congestion are ranked equally with a weight of 0.08 each, Income and Distance to Work are of average importance as they rated 0.06 and 0.07, respectively. Table 3 provides indicator weight.

In the study communities, La, Labone, and Osu are high-crime areas in the southeast, the University of Ghana in the north, and several small low-income communities in the central portions of AMA. These main AMA communities include Kpehe, Avenor, Maamobi, Nima, Adabraka, Tudu, Russia, and Lartebiokorshie.

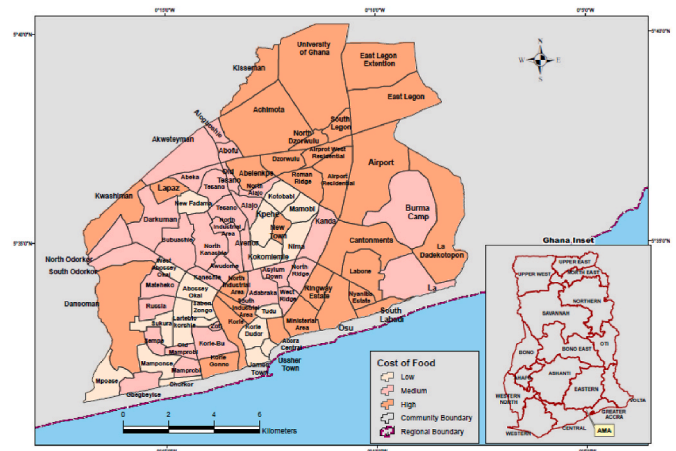


Fig. 4a. Locals' perceived level of cost of food for Accra Metropolitan Area.

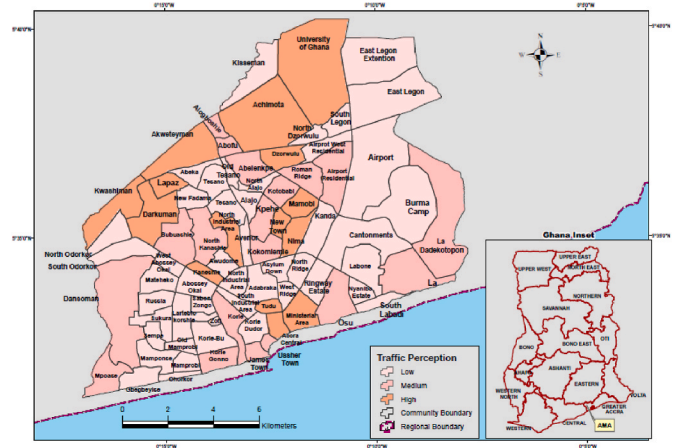


Fig. 4b. Locals' perceived level of traffic congestion in Accra Metropolitan Area.

Source: Authors' Construct (2023).

Similarly, Mamobi, Nima, Tesano, Mpoase, Tudu, Mampose and Kpehe have low renting costs compared to communities like Mataheko, Kaneshie, Darkuman, Kanda and Kwasiman, and others, which are considered to have medium rent costs (Fig. 3a). The high renting cost communities such as Achimota, Dzorwulu, the University of Ghana area, Airport Residential, and East Legon are condensed in the eastern part of the study area. Others, like North Kaneshie and Avenor, are in the central part of the study area. In the western half of the research region, there are a few communities with high rents, such as South and North Odorkor and Dansoman. In general, the central part of the study location has a lower rent cost than the eastern and western parts of the study area.

While food costs follow the pattern of rent costs, settlements in North and South Odorkor, which have high renting costs, are found to have medium food costs (Fig. 3b). Consistent with rent costs, Nima, Mamobi, Mpoase, Tudu, and Kpehe have relatively low food costs. Although Abeka and Akweteyman have high rent costs, food costs appear lower to medium expenses, unlike the other settlements with high rent costs.

Generally, traffic congestion in the study area can be considered low. However, the northern part of the study area, consisting of settlements like Kwashiman, Akweteyman, Achimota and the University of Ghana, has high traffic congestion (Fig. 4a). There is no identifiable pattern among areas such as Korle Gonno, Bobuashie and Abelenkpe with medium traffic congestion. However, the central and eastern parts of the study area are dominated by settlements with low traffic congestion.

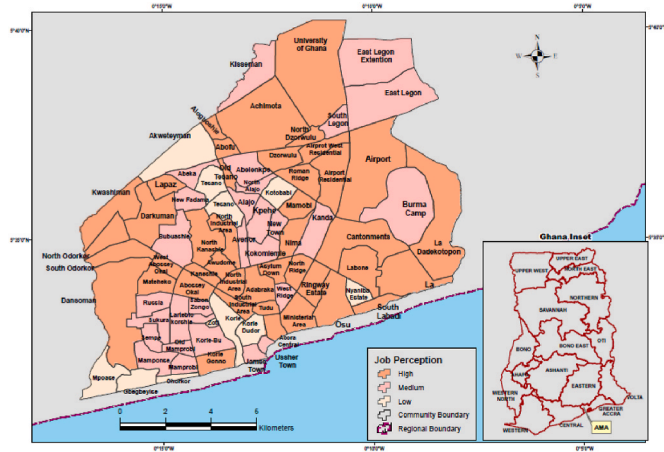


Fig. 5a. Locals' perception of job availability in Accra Metropolitan Area.

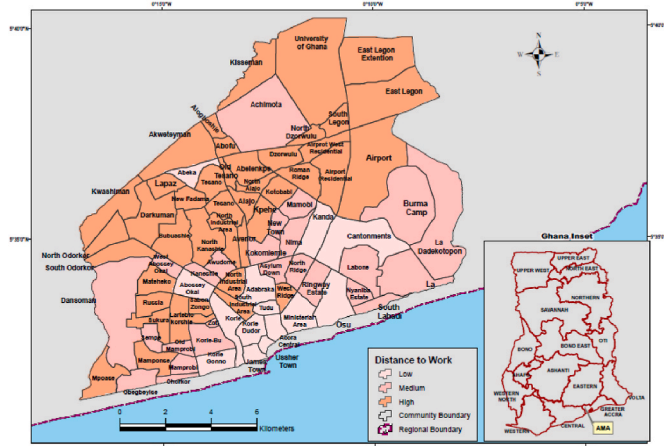


Fig. 5b. Local perception of residents' commuting distance between work and residence in Accra Metropolitan Area. Source: Authors' Construct (2023).

The probability of finding jobs within the study area is considered generally high, as the results show that more than 60% of the settlements have high job availability (Fig. 4b). Several settlements like East Legon, Kanda, and Korle-Bu, which are scattered across the study area, have only medium job availability. Pockets of places in the extreme

southwestern part of the study area, such as Mpoase and Gbegbeyise, have low job prospects, similar to Akweteyman in the west-northern part of the study area.

The results show that in the northern part of the study area, community members commute long distances from their homes to their workplaces (Fig. 5a). Abeka and Achimota are the outliers in this pattern, characterised by short and medium distances from home to work, respectively. The central-southern part of the study area constituting settlements such as Korle Gonno, Tudu, Osu, Kanda, and Cantonments have relatively lower commute periods to work compared to settlements in Mamobi, Dansoman, Nima, Kaneshie, and Korle-Bu with medium distances from home to work. The southeastern and western parts of the study area are dominated by settlements with medium lengths from home to work.

In the northern part of the study area, there is a pattern of high public transportation, especially in settlements such as Achimota, University of Ghana, East Legon Extension, Akweteyman, Kwashiman and North and South Odokor (Fig. 5b). The accommodations with high public transportation extend through the study area's western, central, and southern parts. The settlements like Tesano, Darkuman, Burman Camp, Korle-Bu, and Mamponse, with medium public transportation, are all scattered across the study area. Settlements with low public transportation, such as Cantonments, Dzorwulu, East Legon, and Airport, dominate the central-eastern part of the study area.

The eastern part of the study area extending towards the central part is dominated by settlements with high availability of entertainment (Fig. 6a). This is found in settlements such as East Legon, Achimota, Kwashiman, Danson, Labone, Osu, La, Abelenkpe, and Dzorwulu. The central-western part of the study area has medium entertainment availability, as seen in settlements such as Korle, Mataheko, Abeka, and Lapaz. This pattern is only slightly intercepted by a few settlements with low entertainment availability, such as Korle-Bu, Tudu and North Kaneshie.

The entire eastern part of the study area is at low risk of being flooded (Fig. 6b). This area has settlements like East Legon, the University of Ghana, Achimota, Kisseman, Burma Camp, and Cantonments. Only a few settlements away from the eastern part of the study area also show low flood risks. These settlements are North Kaneshie, Tudu, Korle-Bu, and Sam Pe. The settlements with medium to high flooding risks are all in the western and central part of the study area.

Settlements such as East Legon, Dzorwulu, Abelenkpe, Airport, and the University of Ghana, with high-income levels, can mostly be seen in the northeastern part of the study area (Fig. 7a). While low-income earners are concentrated in the central part of the study area, settlements like Korle Gonno, La, Mpoase, and Gbegbeyise in the southern

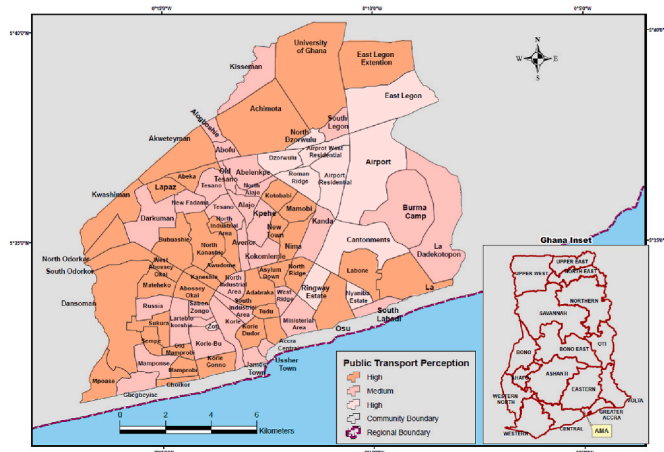


Fig. 6a. Locals' perception of availability and access to public transportation in Accra Metropolitan Area.

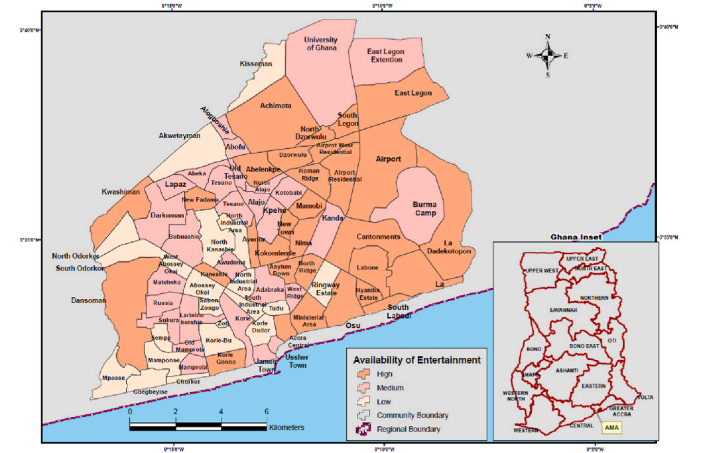


Fig. 6b. Locals' perception of the availability of entertainment in Accra Metropolitan Area. Source: Authors' Construct (2023).

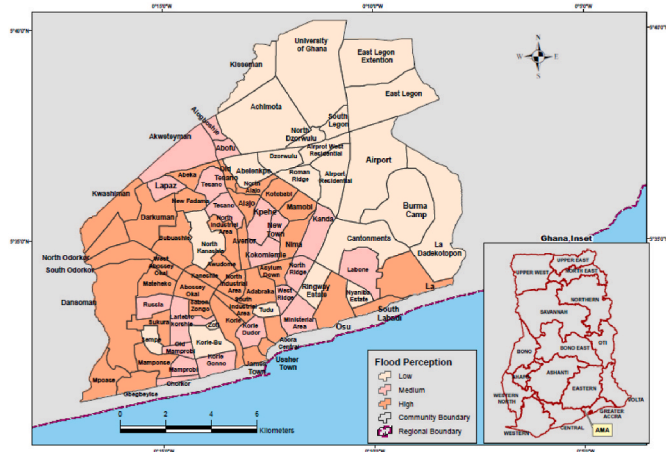


Fig. 7a. Locals' perception of flood risk in Accra Metropolitan Area.



Fig. 8b. Locals' perception of levels of sanitation conditions in Accra Metropolitan Area.

Source: Authors Construct (2023).



Fig. 7b. Locals' perception of residents' income levels in Accra Metropolitan Area.

Source: Authors' Construct (2023).

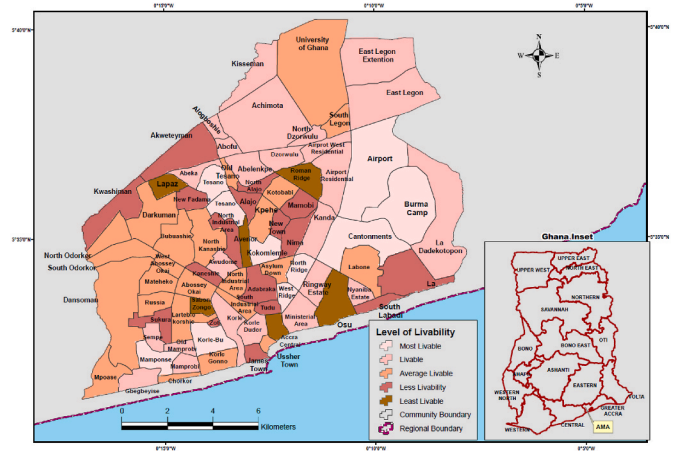


Fig. 9. Levels of liveability in Accra Metropolitan Area.

Source: Authors' Construct (2023).

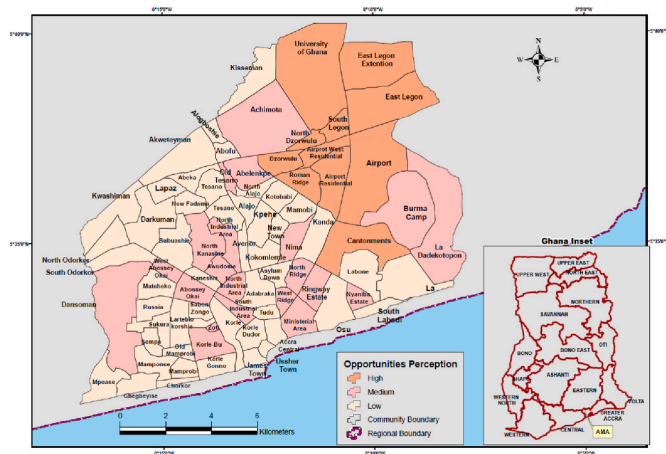


Fig. 8a. Locals' perception of opportunities for residents' success in Accra Metropolitan Area.

part of the study area, also have low-income levels. Some middle-income earners can be found in settlements in the central part of the study area, such as North Kaneshie and Kanda. However, settlements in the study

area's extreme eastern region, such as La Dadekotopon and Burma Camp, and in Dansoman in the western part of the study area, also have middle-income earners.

The settlements with very high opportunities for success, such as East Legon, Dzorwulu and the University of Ghana, are concentrated in the northeastern part of the study area (Fig. 7b). Burma Camp and La Dadekotopon in the southeastern part of the study area and Achimota and Abelenkpe in the north have high opportunities for success. Settlements in the study area's north-western and central territories, such as Lapaz, Abeka, Darkuman, Kaneshie, and Adabraka, have medium opportunities for success. La, Kotobabi, Mamobi, Tudu, and Korle are among the settlements with low prospects for success. Very few settlements, such as Mpoase in the extreme southwestern part of the study area, have very low opportunities for success.

The data analysis results on sanitation show that the University of Ghana, Airport Residential and the Airport are the only settlements with excellent sanitation (Fig. 8a). Settlements along the north-central part of the study area, such as Dzorwulu, Abelenkpe, Abeka, and North Kaneshie, have good sanitation. The study area is dominated by settlements with average, poor, and worse sanitation, such as Tudu, Nima, and Mataheko (see Fig. 8b).

In a final synthesis, we ranked communities on a scale of 1–5 (5 quintiles), with the 1st quintile as the most liveable while the 5th quintile is the least comfortable. Fig. 9 shows that 10 out of 81

communities are ranked most liveable. These include Cantonments, the Airport area, Tesano, West Ridge, and North Ridge. Six (6) Communities are classified as least liveable. These include Osu, Accra Central, Lapaz, Saboa Zongo, Avenor, and Roman Ridge. The majority of communities (24 out of 81) are ranked 3rd quantile on the 1–5 liveability scale. These include the University of Ghana and South Legon. Others are Old Tesano, Darkuman, Dansoman, Labone, and Kole Gonno. The 1st quantile communities are mainly high-income communities, while 5th quantile communities are mainly middle-income communities that have become commercial areas. Not surprisingly, high-income communities like the airport residential area, east legon, and Dzorwolu all fall into the 2nd quantile as all these communities gradually turn into mixed commercial and residential places. The information about the liveability of the metropolitan area is presented in Fig. 9.

## 5. Discussion

This study sought to construct local-based urban liveability indices and apply them to develop a composite assessment of the liveability of communities in Accra, Ghana. The study used a transdisciplinary approach, drawing on interactions between academic and non-academic participants at a stakeholder meeting to access data. The findings illustrate spatial commonalities and variations regarding needs and access to the study area's socio-economic and ecological indicators of liveability. The study's focus on different socio-economic settings, such as lower, middle, and upper-income areas, addresses the critique of liveability as being too focused on middle-class or upper-class urban areas (Sheikh & van Ameijde, 2022).

As revealed in the study, crime is ranked as the highest liveability indicator in all the communities studied. This outcome is not surprising, considering that existing evidence shows that crime rates in large cities are more significant than in small towns or rural areas (Glaeser & Sacerdote, 1999). Notwithstanding a 40.2% reduction over the last fifteen years, total crime rates in the Greater Accra Region, of which Accra is the capital, remain high compared to regional and national norms (Dziwornu, 2021). People's concerns about crime are central to their safety, a need requisite to make their communities attractive and liveable. Indeed, security is ranked the second highest on Maslow (1943)'s categorisation of individual needs and is influenced by their search for protection of their lives and properties. Safety need marks a physical desire that resonates with Alderfer (1969)'s 'existence category' notion, which he espouses in his three-fold conceptualisation of human needs: existence, relatedness, and growth (ERG). Safety in the researched communities depends on crime control to lower the probability of feeling threat and vulnerability (Rojas, Méndez, & Watkins-Fassler, 2023). While crime is prevalent in Accra, it is particularly pronounced in low-income and newly developed areas. High-income communities exhibited low crime vulnerability across the entire study area. In the absence of high and frequent police patrol across the districts, high-income neighbourhoods have coping mechanisms for crime prevention. With solid walls and investments in security equipment and personnel, affluent neighbourhoods in East Legon, Airport Residential, and Airport West have shown low crime and are safer. In older residential and low-income areas of AMA, petty theft has equally affected people's perception of their safety.

According to Maslow (1943), shelter and food constitute psychological needs, the highest in individual needs. As found in this study, an individual's ability to afford rent for shelter guarantees them refuge in their communities, while food is crucial for their existence as humans. Although, per Maslow's theory, psychological needs such as food and shelter are categorised as more critical than safety (crime), the latter ranks higher regarding the liveability perception indices in Accra. Since many residential facilities are now utilised for business purposes, the demand for residential accommodation in the inner city districts is medium. It is also logical that high-rent areas cater to the wealthy and middle-income earners. These neighbourhoods are primarily in the

peripheries where new projects have occurred and continue to occur: Legon, East Legon, Cantonments, Osu, and South Legon. Low-rent areas, including Nima, Mamobi, and Kpehe, are generally poor and densely populated. Interestingly, most areas with high rents have low or medium food costs, which, in our opinion, decreases residents' expense burden and improves their liveability in those areas.

The existing literature underscores the significance of indicators such as entertainment, jobs, opportunities, sanitation, public transportation, traffic congestion, income levels, and distance to work and how they influence urban liveability (Badland & Pearce, 2019; Haarhoff, Beattie, & Dupuis, 2016; Hussien, Gabr, & Zayed, 2023; Wen, Kenworthy, Guo, & Marinova, 2019). Although these factors are essential to Accra inhabitants, they are ranked as the lowest indicators of an area's liveability. Variations in these parameters, like the preceding factors discussed above, indicate the liveability potentials of various communities. The eastern part of Accra is home to most upper and middle-income earners, attracting a supply of entertainment activities and their associated patronage. This is crucial for the city's development since the entertainment industry can enhance liveability by providing residents a variety of cultural, artistic, and recreational activities.

Moreover, a high standard of living can support the entertainment sector by creating a steady and engaged customer base. International visitors and expats interested in experiencing Ghanaian culture are generally drawn to the entertainment industry and nightlife of East Legon, Cantonments, and the Osu-Labone area. These factors can support the growth of a vibrant community that improves its residents' overall quality of life. However, the emergence of rapid digital adoption aided by the recent COVID-19 pandemic explains why entertainment falls low on individuals' liveability concerns (Mitchell, 2023). In contrast to the past, people now obtain entertainment such as music, movies, and other media digitally.

Accra attracts many enterprises, including foreign direct investments (Arthur, 2018; Stack & Amisah, 2022), which provides many jobs. Settlements with medium job availability typically have a sizeable blend of formal and informal economic activities. Low-income communities with minimum job prospects have little industry and substantial economic activity. Consequently, inhabitants of these areas typically travel outside of their neighbourhoods to work or search for jobs. Accra's contemporary physical expansions include the construction of office complexes, shopping malls, hotels, and residential flats in new locations that complement the city's central business district (Arthur, 2018). As reported earlier, territories such as Lapaz, Abeka, Darkuman, Kaneshie, and Adabraka have medium opportunities for success since they represent a centre for various commercial activities, especially in the informal sector. According to this study, places with minimal odds of success are populated by poor indigenous people and migrants with little or no access to job possibilities. We observed that sanitation is usually well managed in planned communities inhabited by high-income earners. The critical issue with Accra's geographical sanitation differences, as identified in this study, suggests a dichotomy between access and financial capacity for sanitation services, leading to the indiscriminate waste dumping. This phenomenon is common in other major Ghanaian cities (Owusu, 2010).

Several studies have shown a positive correlation between public transport and liveability indices, including Mattson et al. (2021). We find a similar correlation in many parts of Accra. Various socioeconomic activities, including jobs, healthcare, and education, are concentrated in these areas, drawing a lot of public transportation. This raises these communities' liveability scores (both high and medium). However, a small section of the communities studied showed a negative correlation between public transport and liveability since most residents are high-income earners who prefer private vehicles.

Similarly, the alignment of main routes used by public transport (commuter buses) is aimed at avoiding these wealthy neighbourhoods. The commuter buses use the following major roads: Kasoa-Accra Central via Graphic Road and the N1 motorway, Accra Central-Adentan via the

N4 highway, Accra-circle-Nsawam via the N6 highway, and Accra-Tema via the N4 and N1 highway. All of these public routes are not in high-income neighbourhoods. Besides the northern part of Accra providing significant public transport accessibility induced by various land use activities, the areas lie within major inter-regional and international transport corridors (N4 and N1 Highways), leading to traffic congestion, especially during peak hours of the day. Low-traffic zones are predominantly residential and are less polluted (Airport Residential Area, Cantonments, and East Legon).

Income and liveability appear to have a complex relationship. While revenue is important in creating a liveable community, it is not the only factor. Income levels, access to resources and amenities, social variables, and other elements that contribute to a high quality of life must all be balanced. The affluent northeastern and extreme eastern part of Accra has a high liveability rating due to the availability of amenities and services and resources. While state social intervention policy to guarantee decent accommodation for low-income earners is lacking in low-income communities, the private sector provides decent housing that attracts only high-income earners (Danso-Wiredu & Midheme, 2017). Given Ghana's current dismal economy, as indicated by expensive petrol and transportation costs, the long distance that residents of the northern part commute to work is worrying. Long commutes harm many aspects of everyday life, including physical and mental health, family and social relationships, and overall quality of life.

This study has shown that Accra has many medium and high-risk flood zones making the metropolis a key source of human vulnerability (Amoako & Frimpong Boamah, 2015). This confirms Owusu and Agbozo (2019) finding that over 51% of AMA is classified as high to medium flood vulnerability. While residents of low-risk flood zones enjoy some peace and tranquillity, those living in medium- or high-risk flood zones may face severe difficulties to their safety, health, property, and overall well-being. Higher insurance rates and decreased property values potentially impact high and medium-risk flood zones, which may influence inhabitants' financial stability. Since businesses and organisations may be hesitant to establish in high-risk locations, access to facilities and services may be limited. This may diminish employment opportunities and make it more difficult for citizens to obtain needed services. Due to poor state social intervention policies, low-income areas lack social amenities and resources. This implies that local government systems (district assemblies) are failing as development agents. The few social, economic, environmental infrastructure and resources provided by the central government are frequently drawn to areas with voices where influential individuals live.

## 6. Conclusions

In general, this study has shown variations in factors that spell out the liveability potentials of the various communities. Using the proposed liveability indices, we can begin to monitor the local government system and their function of promoting balance development within their district. For example, in this study, we identified 81 communities; out of 81, 10 communities were classified as the most liveable. These include Cantonments, the Airport area, Tesano, West Ridge, and North Ridge. The minor liveable communities were Osu, Accra Central, Lapaz, Saboa Zongo, Avenor, and Roman Ridge. On a scale of 1–5 (5 quantiles), the majority of municipalities (24 out of 81) received a 3 (3rd quantile) for liveability, and some of these communities are South Legon, Old Tesano, Darkuman, Dansoman, Labone and Kole Gonno and the University of Ghana. These results suggest that the metropolitan area should concentrate its community revitalisation efforts on communities with lower liveability scores. Improvements in these communities' liveability indicators over time can be used to assess the administration's effectiveness. Communities may benefit from revitalisation in many ways, including improving their physical setting, more robust social bonds, and a higher quality of life.

We conclude that the results of this study provide a standard

measurement technique for measuring liveability in cities of the global south that share similar characteristics as AMA, although the local perception of indicators to be included may vary due to variations in spatial-demographic characteristics, urban architecture, demographics, governance, and development priorities. Including local perception and priorities in liveability, the assessment provides a more practical and helpful approach that local people can own and appreciate. This may go a long way in providing a standard measurement of the city's progress and the overall performance of city authorities as agents and leaders for promoting local balance development. This study has provided a liveability perception geography of AMA, and continual monitoring will help track the temporal path to Accra's development. The main limitation of this study was its scope, as the paper considered Accra without paying attention to the Greater Accra region, with most places becoming the hotspot for urban concentration with its ramifications on landscape changes. Though this limitation existed, the study's findings are still valid irrespective of the limitations. A more detailed analysis should be undertaken by considering the whole of Greater Accra and, if possible, the other regional capitals in Ghana; this will contribute to urban planning and the distribution of infrastructure by the central government. The current research will be good academic material for policy and practice and help land use planners.

## CRedit authorship contribution statement

**Alex Barimah Owusu:** Conceptualization, Methodology, Software. **Collins Adjei Mensah:** Data curation, Writing – original draft. **Iris Ekua Mensimah Fynn:** Data curation, Writing – original draft. **Clement Kwang:** Visualization, Investigation. **Isaac Kwamena Arthur:** Writing – review & editing. **Kofi Adu-Boahen:** Visualization, Investigation.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgements

We are grateful to Mr Francis Andorful of the RSGIS Lab for supporting the transdisciplinary learning data collection and analysis. Also, we thank the participants for providing information during the research.

## References

- d'Amour, C. B., et al. (2017). Future urban land expansion and implications for global croplands. *Proceedings of the National Academy of Sciences*, 114, 8939–8944.
- AARP. (2011). *Ageing in place: A state survey of liveability policies and practices*. Washington, DC: AARP Public Policy Institute.
- Acheampong, R. A. (2021). Accra: City scoping study. Retrieved on April 25, 2023 from [https://www.african-cities.org/wp-content/uploads/2021/12/ACRC\\_Accra\\_City-Scoping-Study.pdf](https://www.african-cities.org/wp-content/uploads/2021/12/ACRC_Accra_City-Scoping-Study.pdf).
- Akmar, A. A. N., Hersperger, A., Kabisch, N., Mensah, C. A., Wang, X., & Douglas, I. (2021). Local governments and urban ecology: Planning and practice examples from Africa, Asia and Europe. In P. Anderson, I. Douglas, D. Goode, et al. (Eds.), *Routledge handbook of urban ecology* (2nd ed., pp. 907–942). Abingdon: Routledge.
- Alderfer, C. P. (1969). An empirical test of a new theory of human needs. *Organizational Behavior & Human Performance*, 4(2), 142–175.
- Amoako, C., & Frimpong Boamah, E. (2015). The three-dimensional causes of flooding in Accra, Ghana. *International Journal of Urban Sustainable Development*, 7(1), 109–129.
- Arthur, I. K. (2018). Exploring the development prospects of Accra Airport city, Ghana. *Area Development and Policy*, 3(2), 258–273.
- Asian Development Bank. (2019). *Creating liveable cities: Regional perspectives*. Manila: Asian Development Bank.
- Badland, H., & Pearce, J. (2019). Liveable for whom? Prospects of urban liveability to address health inequities. *Social Science & Medicine*, 232, 94–105.
- Baobeid, A., Koç, M., & Al-Ghamdi, S. G. (2021). Walkability and its relationships with health, sustainability, and liveability: Elements of physical environment and evaluation frameworks. *Frontiers in Built Environment*, 7, Article 721218. <https://doi.org/10.3389/fbuil.2021.721218>
- Breiner, H., Ford, M., & Gadsden, V. L. (2016). *Parenting matters: Supporting parents of children ages 0-8*. Washington (DC): National Academies Press (US), 2016 Nov 21. 2,

- Parenting Knowledge, Attitudes, and Practices. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK402020/>.
- Capitaino, M. (2017). The relativity of liveability rankings examining the Japanese case against the global discourse. *World Journal of Social Science*, 1(5), 12–18.
- Carmona, M. (2019). Place value: Place quality and its impact on health, social, economic and environmental outcomes. *Journal of Urban Design*, 24(1), 1–48. <https://doi.org/10.1080/13574809.2018.1472523>
- Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BMC Medical Research Methodology*, 11, 100. <https://doi.org/10.1186/1471-2288-11-100>
- Danso-Wiredu, E. Y., & Mitheme, E. (2017). Slum upgrading in developing countries: Lessons from Ghana and Kenya. *Ghana Journal of Geography*, 9(1), 88–108.
- Dodman, D., Leck, H., Rusca, M., & Colenbrander, S. (2017). African urbanisation and urbanism: Implications for risk accumulation and reduction. *International Journal of Disaster Risk Reduction*, (26), 7–15. <https://doi.org/10.1016/j.ijdrr.2017.06.029>. ISSN 2212-4209.
- Dziwornu, M. G. (2021). Crime drop in Ghana? Some insights from crime patterns and trends. *Crime Prevention and Community Safety*, 23, 433–449.
- EIU. (2018). *Liveability report-global liveability survey*. London: Economist Intelligence Unit.
- George, A. L., & Bennett, A. (2005). *Case studies and theory development in the social sciences*. Cambridge: MIT partiPress.
- Ghana Statistical Service. (2021). *The 2021 population and housing census: General report (volume 3A)*. Accra: Ghana Statistical Service.
- Glaeser, E. L., & Sacerdote, B. (1999). Why is there more crime in cities? *Journal of Political Economy*, 107(S6), S225–S258.
- Güneralp, B., & Seto, K. C. (2013). Futures of global urban expansion: Uncertainties and implications for biodiversity conservation. *Environmental Research Letters*, 8, Article 014025.
- Haarhoff, E., Beattie, L., & Dupuis, A. (2016). Does higher-density housing enhance liveability? Case studies of housing intensification in Auckland. *Cogent Social Sciences*, 2(1), Article 1243289.
- Holden, M. (2012). Is integrated planning any more than the sum of its parts? Considerations for planning sustainable cities. *Journal of Planning Education and Research*, 32(3), 305–318.
- Hussien, W., Gabr, H. S., & Zayed, M. A. (2023). Examining the influential factors on urban growth and population attraction: A case study of Almere, Netherlands. *Information Sciences Letters*, (12), 5. <https://digitalcommons.aaru.edu.jo/isl/vol12/iss5/30>.
- Lowe, M., Whitzman, C., Badland, H., Davern, M., Hes, D., Aye, L., et al. (2013). *Liveable, healthy, sustainable: What are the key indicators for Melbourne neighbourhoods?* Melbourne: Place, Health and Liveability Research Program, University of Melbourne.
- Madden, P., & Gutman, J. (2020). *Urban economic growth in Africa: Analysing constraints to agglomeration*.
- Mahatta, R., Fragkias, M., Güneralp, B., Mahendra, A., Reba, M., Wentz, E. A., et al. (2022). Urban land expansion: The role of population and economic growth for 300+ cities. *Urban Sustainability*.
- Major Cities Report. (2013). *State of Australian cities 2013*. Canberra: Department of Infrastructure and Transport, Australian Government.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370.
- Mattson, J., Brooks, J., Godavarthy, R., Quadrioglio, L., Jain, J., Simek, C., et al. (2021). Transportation, community quality of life, and life satisfaction in metro and non-metro areas of the United States. *Well-being, Space and Society*, 2, Article 100056.
- McDonald, R. I., Mansur, A. V., Ascensão, F., et al. (2020). Research gaps in knowledge of the impact of urban growth on biodiversity. *Nature Sustainability*, 3, 16–24.
- Mercer. (2011). *2011 quality of living worldwide city rankings – Mercer survey*. London: Mercer.
- Mitchell, C. (2023). Africa's media and entertainment industry at a crossroads. *African Business*. URL:<https://african.business/2023/02/trade-investment/africas-media-and-entertainment-industry-at-a-crossroads>.
- Mori Memorial Foundation. (2011). The global power city index 2011. Retrieved online on May 1, 2023 from [https://mori-m-foundation.or.jp/pdf/GPCI2011\\_en.pdf](https://mori-m-foundation.or.jp/pdf/GPCI2011_en.pdf).
- Mori, K., & Christodoulou, A. (2012). Review of sustainability indices and indicators: Towards a new City Sustainability Index (CSI). *Environmental Impact Assessment Review*, 32(1), 94–106.
- OECD/UN ECA/AfDB. (2022). *Africa's urbanisation dynamics 2022: The economic power of Africa's cities*, West African Studies. Paris: OECD Publishing. <https://doi.org/10.1787/3834ed5b-en>
- Owusu, G. (2010). Social effects of poor sanitation and waste management on poor urban communities: A neighborhood-specific study of Sabon Zongo, Accra. *Journal of Urbanism*, 3(2), 145–160. <https://doi.org/10.1080/17549175.2010.502001>
- Owusu, A. B., & Agbozo, M. (2019). Application of geographic information systems for flood risk analysis: A case study of the Accra metropolitan area. *Journal of Present Environment and Sustainable Development*, 13(1), 81–98.
- Pandey, B., & Seto, K. C. (2015). Urbanisation and agricultural land loss in India: Comparing satellite estimates with census data. *Journal of Environmental Management*, 148, 53–66.
- Pawson, R. (2013). *The science of evaluation: A realist manifesto*. Sage Publications.
- Peris-Ortiz, M., Bennett, D., & Yábar, D. (2017). *Sustainable smart cities: Creating spaces for technological, social and business development*. Springer.
- Pohl, C. (2011). What is progress in transdisciplinary research? *Futures*, 6(43), 618–626. <https://doi.org/10.1016/j.futures.2011.03.001>
- Rojas, M., Méndez, A., & Watkins-Fassler, K. (2023). The hierarchy of needs empirical examination of Maslow's theory and lessons for development. *World Development*, 165, Article 106185.
- Rycroft-Malone, J., Wilkinson, J., Burton, C. R., Harvey, G., McCormack, B., Graham, I., et al. (2013). Collaborative action around implementation in collaborations for leadership in applied health research and care: Towards a programme theory. *Journal of Health Services Research & Policy*, 18(3), 13–26.
- Sasanpour, F., Simin, T., & Hamza, J. A. (2015). Measuring and assessing urban liveability in twenty-two regions of Tehran metropolitan area. *Regional Planning Quarterly*, 18, 42–27.
- Sheikh, W. T., & van Ameijde, J. (2022). Promoting liveability through urban planning: A comprehensive framework based on the "theory of human needs". *Cities*, 131, Article 103972.
- Stack, M. M., & Amissah, E. B. (2022). The presence of foreign firms in Ghana: The role of financial, infrastructural and institutional constraints. *Journal of African Business*, 23(4), 925–944.
- Statista. (2023) Accessed from <https://www.statista.com/statistics/1223543/urbanization-rate-in-africa-by-country/>. (Accessed 5 August 2023).
- Sulemana, I., Nketiah-Amponsah, E., Codjoe, E. A., & Nyarko Andoh, J. A. N. (2019). Urbanisation and income inequality in sub-Saharan Africa. *Sustainable Cities and Society*, 48, Article 101544.
- Tennakoon, T. M. M. P., & Kulatunga, U. (2019). Understanding liveability: Related concepts and definitions. In Y. G. Sandanayake, S. Gunatilake, & A. Waidyasekara (Eds.), *Proceedings of the 8<sup>th</sup> world construction symposium* (pp. 578–587). <https://doi.org/10.31705/WCS.2019.57>. Colombo, Sri Lanka, 8–10 November.
- Tress, G., Tress, B., & Fry, G. (2005). Clarifying integrative research concepts in landscape ecology. *Landscape Ecology*, 20, 479–493. <https://doi.org/10.1007/s10980-004-3290-4>
- United Nations. (2019). *World urbanisation prospects: The 2018 Revision*. New York: United Nations.
- United Nations. (2022). *Handbook of statistics*. Geneva: United Nations Conference on Trade and Development.
- United Nations Department Economics and Social Affairs, (UNDESA). (2014). *Population facts*. <http://www.unpopulation.org>.
- Vermeulen, W. J. V., & Witjes, S. (2020). History and mapping of transdisciplinary research on sustainable development issues. *Transdisciplinarity For Sustainability*, 18, 6–26.
- Wen, L., Kenworthy, J., Guo, X., & Marinova, D. (2019). Solving traffic congestion through street renaissance: A perspective from dense Asian cities. *Urban Science*, 3(1), 18.