

Liveability Concept for Development of Urban Built Environment: Case of Sri Lanka

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Abstract

Globally, urban development has been limited to improvements in built environment. Similarly, in Sri Lanka, compromise of the natural environment and inability to response real life expectations of inhabitants have rested the rigorous urban sprawl in a debatable position. Therefore, need for a multi-disciplinary approach towards urban development was identified when implementing new development projects. A robust environment with affordable amenities, accessibility to services and environmentally sustainable community is recognised as a liveable city. Thus, liveability is selected as a common platform to analyse this need, because liveability is the short-term suspense of inhabitants of cities of Sri Lanka; especially in Colombo. For this study, a survey strategy is adapted by interviewing experts in sociology, ecology, town planning and architecture who are experienced in urban planning. A thematic analysis is steered on healthcare, security, stability, economy, infrastructure and environment. Study reveals that most of liveability indicators related to Sri Lanka are significantly similar to that of global context, yet resettlement of slum households, waste management and restoration of the ecologically significant areas are context specific. Moreover, attention to socio- economic aspects, environment and character of the city, availability, quality and proximity to services are significant when planning urban built environment.

Keywords

Liveability, Urban development and Built environment.

1. Introduction

Global population is projected to rise from seven billion in 2011 to nine billion by 2050 (UNFPA 2011). As projected in World Urbanization Prospects (2014), majority of the major Asian cities are the densest among the cities in the world., these cities have a main role in providing social and economic wellbeing to the inhabitants (Mori and Christodoulou 2012; Lowe et al. 2015). Consequently, intensified environmental hazards following climatic changes and difficulties in managing the increase in urban population construct a pressure to local authorities (Stevenson et al. 2016). Built environment and built environmental characteristics such as traffic congestion, environmental pollution, excessive waste generation and the competition to construction resources need to be widely assessed to upgrade quality of life of inhabitants (Seto et al. 2012).

Accordingly, to measure the quality of lives of inhabitants, liveability indices such as EIU liveability index and Mercer Quality of life index, have been developed (EIU 2018; Mercer 2018). Liveability indices represent the idealness of a city to live in. Liveability concepts support to strike a balance between the practical implementation of development projects and the ideal outcomes. In return, a well-planned built environment of a city addresses the issues raised from the urbanisation.

Besides, urban planning conferring to the desired level of its inhabitants, is long term and largely a one-off procedure (Mitchell 2005). A multidisciplinary approach is needed to obtain an all-inclusive outlook of the development of the cities. Therefore, this paper is aimed at comprehending the characteristics that make cities more liveable in order to facilitate the urban development planning.

2. Literature Review

Subsequently, the literature synthesis emphasizes on the reasons for unplanned expansion of the urban built environment and the consequences of the urban sprawl. Consecutively, the liveability concepts have also been abridged. Thus, the literature synthesis assists to identify the gap in the current context where the expectations of the inhabitants regarding the urban built environment, are not properly addressed.

2.1 Challenges Related to Urban Development

Cities in Asian region deals with land scarcity, urban sprawl, population growth and housing scarcity (Bracken 2015). Uncontrolled and unplanned development causes traffic congestion, crimes, limited access to resources and issues in waste management (Peris-Ortiz et al. 2017). Hence, citizens have no choice, but to live in a highly dense, high-rise and high intensified cities even though their expectation is a pleasant liveable city (Shabanzadeh et al. 2019). Therefore, urgent need to identify the desired living conditions of the inhabitants is highly significant for urban development (Maridal 2016). Some of the main challenges related to urban development have been identified from Section 2.1.1 to Section 2.1.4 below.

2.1.1. Rush for metropolitanization

Accordingly, Ellis and Roberts (2015) instate, urban development in Asian countries are more towards metropolitanization. Therefore, there is a need to provide infrastructure for public goods and services. Economies of scale achieve through metropolitanization, accelerate engineering advancement and global amalgamation of a city (Au and Henderson 2006). However, when metropolitanization happens at a rate, synchronising infrastructure and industry expansion, ecological conservation and community services provision have been recognized as a challenge (Peris-Ortiz et al. 2017). Hence, characteristics of liveability that defines metropolitanization should be streamlined via proper urban planning.

2.1.2. Lack of urban housing

Moreover, a major issue dealt along with urban development is urban housing (Buxton and Tieman 2005; Uitermark 2009). On the contrary, there is an urgent need to manage available land for activities related to business, leisure and public services other than allocating for urban housing (Woodcock et al. 2011). Nevertheless, it is important to reshape the initiatives on urban development since they are directly related with the liveability of the inhabitants.

2.1.3. Gaps in business governance and related infrastructure

Likewise, narrowing development and infrastructure investment gaps needs prompt expansion of private sector investment and redistribution of these investments from emissions-intensive assets to low-emission and robust infrastructure (Kashef 2016). Inability to align investments with physical infrastructure have direct impacts on the business governance; thus, impacting the profitability of the investors (Peris-Ortiz et al. 2017). Consequently, prevailing business governance decides the attraction of the potential investors. A facilitating infrastructure and liveability of the community are a main concern of small and medium enterprises which are prospering around the urban areas.

2.1.4 Threat to sense of security and occurrence of crimes

Furthermore, intensity of industrial, commercial and domestic built environment of major cities has amplified local inequalities, strain in habitats, and worsened the challenges of city disparity and social disturbance (Balsas 2004; Rayner and Howlett 2009). Along with that, occurrence of crimes and breaches of public security have increased. Public parks, pedestrian crossings, public transport stops and empty commercial spaces are backdrops where there is high possibility of manifestation of illegal activities (Rayner and Howlett 2009). Robberies, sexual offences, violence, vandalism, alcohol consumption and drug dealing are among recurrent illicit activities around urban environment (Setiawan 2017; Sohn 2016). Thus, when addressing these issues with a view to increase liveability of inhabitants, liveability characteristics need to be incorporated in urban built environment planning.

2.2 Concept of Liveability

Liveability is a concept with multivalent meanings. Generally, if a place is inhabited it is liveable. Nonetheless, when considering urban liveability, the use of word “*liveability*” represents notions to improve habitat to the desired level of inhabitants.

2.2.1 Defining liveability

Consequently, as a response to upgrading quality of life, liveability concepts may utilize. Kashef (2016), Capitano (2017) and Valcárcel-Aguiar et al. (2018) have emphasised the importance of liveability concepts to reshape built environment considering socio-economic values. Shabanzadeh et al. (2019) instate, assessment criteria of liveability depends on inhabitants’ personality, culture, traditions and expectations. Giap et al. (2014) on the other hand proclaim that liveability is, “... a place-based concept generally refers to the elements of home, neighborhood, or city that contribute to quality of lives and well-being.”

In the same way, Valcárcel-Aguiar et al. (2018) identifies liveability characteristics as, “... a set of attributes or physical, social and economic characteristics of a specific urban area, once improved, will have a positive impact on residents’ quality of life, yet without compromising the city’s future.” Moreover, liveability is sensed as the alignment between the desired and actual living environment focusing the betterment of the community (Capitano 2017, p. 13).

Together, this literature establishes the elements of liveability such as alignment of the actual and desired habitat, place based attribute, quality of lives and dependence upon culture, tradition and expectations. Hence, based on the identified elements of liveability, a working definition is adapted as, “the consistency of the desired and actual habitats which reflect the quality of life in terms of the social, economic and environmental characteristics.” This working definition is applied throughout the paper regarding liveability and related terms such as liveable cities, liveability indicators and liveability indexes.

2.2.3 Multidisciplinary approach towards Development of urban built environment through liveability

Likewise, liveability is important to entrepreneurs, not for profit organisations, potential investors, professionals and foreign intellects (Kashef 2016). Therefore, in order to incorporate views of all stakeholders in planning urban built environment, concept of liveability is utilized. For instance, the services conception of infrastructure, held by some stakeholders ranges in varied systems including the quality of built environment, social impacts and the green infrastructure (Seto et al. 2012).

Accordingly, the literature collectively elaborates a clear gap between the practicality of the continuous urban development and the liveability outlooks of the inhabitants on the development. Hence, the paper comprehends the characteristics that make cities more liveable. Through that, the gap between insensible urban development and liveability expectations of inhabitants is abridged.

3. Methodology

Accordingly, the research question address characteristics that make cities liveable. Hence, philosophical stance of the study is positioned at social constructivism because it facilitates understanding realities built by individuals of different backgrounds and reconstituting to include in a scientific realism (Atwater 1996). Between the deductive an inductive approach declared by Saunders et al. (2019), this study follows a deductive approach because a scientific realism of liveability is obtainable through deducing the views of stakeholders of the city of Colombo. Since the population of the stakeholders is large and varied, selecting a reasonable sample is a challenge. Hence, expert interviews are applied as the data collection technique. The expert selection is done through a balanced choice, representing the key stakeholders identified in literature. Table 1 denotes the experts' areas of proficiency and the experience in the relevant areas. They are involved in urban planning projects in Colombo, Sri Lanka. Therefore, they have explicit exposure to the sentiments of pertinent stakeholders. Interviews are administrated by providing a brief introduction to the concept of liveability and followed by questions in a semi-structured interview guideline.

Table 1: The Respondents' Area of Expertise

Respondent Code	Respondents' area of expertise	Organisation	Working Experience
R ₁	Architecture and built environment	Department of Architecture	27-30
R ₂	Town and country planning	Western Region Mega Polis Project	10
R ₃	Town and country planning	Urban Development Authority	10
R ₄	Civil Engineering	National Building Research Organization (NBRO)	12-15
R ₅	Sociology	Department of Sociology, University of Colombo	31
R ₆	Ecology	Sri Lanka Land Development Corporation	10-12
R ₇	Economics	Monetary Board, Central Bank of Sri Lanka	15
R ₈	Health care sector	National Hospital of Sri Lanka, Colombo	10-12

Initially, 5 respondents from architecture, civil engineering, sociology, town and country planning are selected. However, another 3 respondents from ecology, economics and healthcare sector are also interviewed until the collected data is saturated. They have worked in major urban development projects in Colombo, which is the commercial capital of Sri Lanka. Hence, their level of expertise and the involvement with the society, make them eligible to represent the views of the community.

4. Data Analysis and Discussion

As a research method, content analysis is a systematic and objective way of analysing data and construing implications (Schreier 2012). As a prerequisite for effective thematic analysis, the themes were identified concepts that describe the liveability attributes and related phenomenon. After analysing the background, six liveability characteristics were discussed in Section 4.

4.1 Effects of Uncontrolled Take-Over of Built Environment over the Natural Environment

Subsequently, expert views on the effects of urbanization are broadly categorized as direct and indirect effects. The direct and indirect challenges arising from urban development is illustrated in Table 2. The direct effects of urbanization are impaired air and water quality, imbalanced temperature and precipitation. The experts in disaster resilience specifically emphasise the difficulty to prevent floods since the water ways are obstructed by unrestricted constructions and land improvements. Furthermore, the genetic and the biological diversity is threatened in the city of Colombo. Consequently, the land development has replaced the natural eco systems and destroyed the habitats of plants and animals in Colombo wetland eco system.

Accordingly, indirect effects involve uneven distribution of jobs and business opportunities. Administration buildings and business head offices are clustered in the inner city. Thus, the job that are highly commented are only available in Colombo. Therefore, the need to commute daily to the city is perceived. The experts point out aforementioned reason as an influential factor to many indirect issues. The traffic congestion generated through the daily commuting individuals, causes time waste. When it is considered as wasted human hours, it is a loss to the government and business entities. The expert representing the healthcare sector emphasises the indirect effects of congested urban environment. For instance, the air pollution by emissions from vehicles leads reduction of the air quality causing respiratory complications in people.

Table 2 : Challenges due to Urban Development

Direct Effects	Indirect Effects
Impairment of air quality	Increased traffic congestion
The productivity and quality of the soil diminished	The health effects such as depression, obesity and respiratory issues
Impairment of water quality	The social polarization increases
The bio diversity and eco systems are threatened	Crime rates increases
More disposed to natural disasters like floods	The business governance is challenged
The historic and cultural monuments are at risk	Difficulty to manage recreational activities
Resource sustainability is challenged	The prices of the housing increases.

Therefore, when considering these effects direct effects are mostly related to changes in the natural environment. Developments taken place as the improvements in the built environment, cause indirect effects. The ability to incorporate liveability concepts to the effects are considered in the study.

4.2 Liveability Characteristics

Subsequently, the characteristics or the inherent parts that demarcate the level of liveability of a city are defined as liveability characteristics. The measurement of these characteristics are done through liveability indicators. Hence, for this research the characteristics outline the areas to be vigilant when considering further expansion of urban built environment. The expert opinions are summarised into six liveability characteristics as denoted in Figure 1.

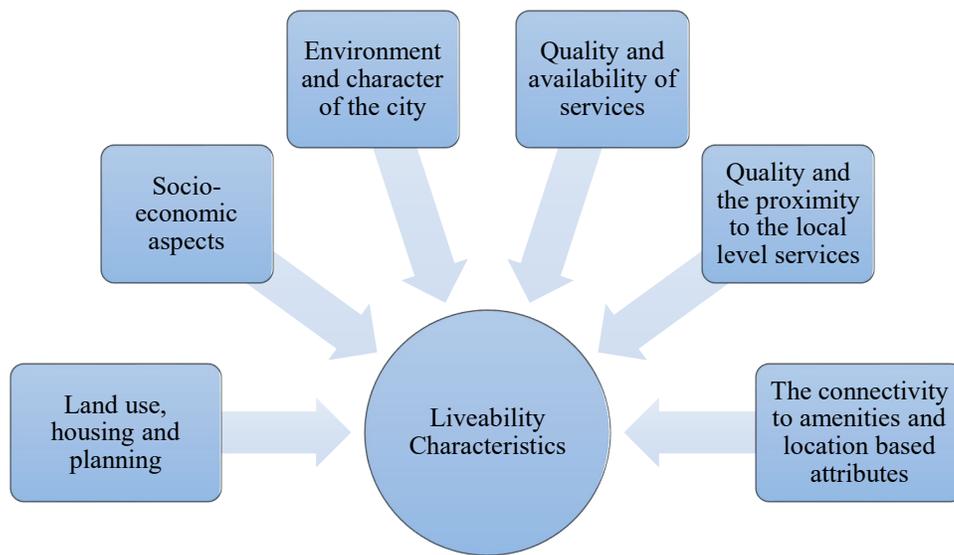


Figure 1: Liveability Characteristics

4.2.1. Proper planning of land use and affordable housing

Consequently, the experts highlight that the rarest resource in Colombo is land. Similarly, Rayner and Howlett (2009) had stated in their study that market price of the land tends to unrealistically increase due to the higher demand for land in urban areas. Experts reveal their experience of costly and time-consuming demolitions of the unplanned construction and the importance of well-planned urban development because building construction is one off activity. Therefore, when coupling land use with liveability concept, expert opinion is to prioritize compatibility of zoning in urban built environment. Thus, residential areas need to be planned well, separating them from the business areas. On the contrary, when the community value low density urban lifestyle, there is a resistance to urban development across the country which only can be mitigated through spatial concentration of high- density development at transport nodes, leveraging the existing infrastructure (Woodcock et al. 2011). Similar notion is held by some experts who instate that urban development is rewarding with mix development projects rather than single use development with zoning. Mix developments cluster domestic, commercial and administrative activities; reducing the need for mobility.

4.2.2. Balanced socio- economic environment

Moreover, mere development of built environment is not a reflection of the socio and economic development of the city (Maridal 2016). Majority of experts reveal aforementioned notion using different reasoning. Experts express that in Sri Lankan context social polarization is at a higher level in city of Colombo. The expert in sociology emphasis, a notion called “Right to the City”. It is a progressive approach to social change as a response to disposition and disempowerment of inhabitants in the process of economic reshaping with development of urban built environment. The experts identify that sense of belonging to community is crucial to make inhabitant satisfied. The political stability of country and local authorities is viewed as characteristics that are contributing to liveability of a city and in return, shaping urban built environment.

4.2.3. Environment and character of the city

According to expert opinion, character of city is largely dependent upon natural environment rather than built environment in emerging cities because values of inhabitants had shifted to a sustainability stance. Experts highlight nonexistence and importance of proper waste management policies in city of Colombo. Furthermore, they point out that character of the city is greatly disturbed by shanties in inner city area of Colombo. Moreover, population per square meter is comparatively less because they span across the city as single level, temporary erections causing issues regarding waste management, epidemics breakouts and the crimes. In addition, the expert in sociology reveal that the shanties and poverty are issues that address rigorous policy changes related to urban planning. Similarly, interviewed environmentalist has observed in an experiment done in the city of Colombo regarding the air quality, the basin effect generated through the high-rise buildings in the inner city has refrained the air movement of the city and has caused a toxic effect. This finding collaborates the idea that liveability indicators such as water and air quality are indirectly affected through development of urban built environment (Peris-Ortiz et al. 2017).

4.2.4. Quality and availability of services

As mentioned in literature, services availability is one of the main reasons that attract people to cities (Stevenson et al. 2016). Above notion is constantly emerged from the interviewed experts. The requisite of both public and private services is instated through interviews. Specially, expert in health care sector has underlined the availability of quality hospitals and secondary healthcare services decides the liveability of a city. Further, the primary and secondary education facilities are viewed as essential factors to uplift the liveability of cities. Likewise, the quality of the education for the inhabitant is revealed as an indicator to be prioritised when measuring liveability. Unavailability of timely and convenient transport services with choices such as public and private or buses and trains in Colombo, is emphasised. The quality of transport services is an upright measurement of the liveability. Other expert opinions include waste management services, disaster management services and fire brigades. The inefficiencies in those services in the city of Colombo is not explicit to the inhabitants in the city, yet the experts have predicted the need of improvement of those services at an event of crisis. The experts have linked the quality and availability of services with built environment. According to them, the development projects within a city need to be strictly regulated because non- profit-oriented nature of the public services infrastructure, is given least priority.

4.2.5. The proximity to local level services

Therefore, availability of public amenities and the ease of accessibility those facilities are a significant attribute of liveability highlighted by the experts. According to most of the respondents, the urban built environment has solicited enough provisions for recreational facilities such as parks, aquatic centres, playgrounds and community pools. The findings of the current study are consistent with those of Bracken, (2015) who has observed that planned cities are concerned about the ease of the accessibility to the recreational facilities and other public amenities. An interviewee who has been asked to explain how the urban planning shape the proximity to local level services, has highlighted the construction of condominiums in the city of Colombo as an example. According to him, the existing recreational facilities, shopping facilities, cafes and restaurants in the city of Colombo is exploited through the plan to construct condominiums in the closest places to those facilities. Another suggestion emerged from the experts is the possibility to increase the proximity not by reducing the distance but through reducing the travel time. The importance of this notion has led to consider it as a separate attribute; the connectivity to amenities and location-based attributes.

4.2.6. The connectivity to amenities and location-based attributes

According to the experts' view, the most practical method of expanding a city is to develop a proper infrastructure to increase the connectivity. The commonly brought forward instance is commuting system established in cities like New Delhi, Kolkata and Mumbai, decentralizing housing from the inner city while accommodating the inhabitants to access the services in the city easily. However, there are literature suggesting otherwise, where transportation-oriented development is introduced as a solution that concentrate citizens within the walking catchments of the activity centers by providing housing in apartments and or condominiums (Dittmar and Ohland 2012). The experts' argument is that efficient transportation methods are the best way to maximally utilize the location-based characteristics. Moreover, expert in ecology has emphasised significance of planning the constructions in Colombo because it is the only commercial capital in the world, located in a wetland. To use the city as a tourist destination for the foreigners on short business trips, hotels and other tourism related amenities, require to be planned.

Nevertheless, the town planners have highlighted the necessity to decentralize housing and industrial zones to the outer city, away from the highly commercialized areas and the administrative areas. According to them, the services may decentralize to a certain extent. For an example, the services such as schools, libraries and recreational facilities may locate along with the housing zones whereas services such as industrial waste recycling plants, powerhouses may locate in industrial zones.

Together, the thematically analysed characteristics of liveability have established the significance of liveability to the inhabitants above concepts such as sustainability. Hence, characteristics of liveability may prioritize in urban development planning since it is the reflection of the inhabitants' short-term expectations.

5. Liveability Indicators Identified, based on the Liveability Characteristics

Likewise, in the previous section the liveability characteristics of a city are analysed based on the expert views. The liveability characteristics are a set of attributes that are expected by the inhabitants from a city, for it to be liveable. It is difficult to derive elements of urban planning through the liveability characteristics all alone because these liveability characteristics are expressed qualitatively.

Therefore, experts' opinions have been fragmented to more measurable elements of liveability. In this paper, these fragments of liveability characteristics are known as liveability indicators. The liveability indicators demonstrate measures to make development in the urban built environment more habitable. Through disintegrating the liveability characteristics further as liveability indicators, the process of urban built environment development planning is streamlined in this study.

Subsequently, the main six liveability characteristics identified via expert interviews are kept as the base of the thematic analysis and the liveability indicators articulated by the experts are listed in Table 3.

Table 3: Liveability Indicators identified through expert interviews

Liveability Attribute	Liveability Indicator
Proper land use, housing and planning	Availability of affordable housing
	Availability of choices for housing
	Services development in slum areas
	Resettlements of shanty dwellers
	Number of acts passed annually for urban development
	Budgetary allocations for urban development
Balanced socio- economic aspects	Public areas covered by surveillance systems
	Unemployment rate
	Social acceptance in the residential area
	Restoration of ecologically significant areas
Environment and character of the city	Restoration of historic buildings for reuse
	Availability of green spaces/ urban land space
	Need for obtain LEED or equivalent certification for new buildings
	Hotel occupancy
	Quality pipe borne water supply
Quality and availability of Services	Coverage of sewerage network
	Coverage of solid waste collection
	Energy requirement consequent from renewable sources
	Prevalence of electricity interruptions
	Availability of educational facilities
	Accessibility to digital education
	Availability of emergency medical services
	Adequacy of the in- patient beds
	Adequacy of healthcare professionals
	Frequency of water borne diseases
Frequency of vector borne diseases	
The proximity to the local level services	Accessibility to retail shops
	Availability of restaurants and cafes
	Availability of adequate coverage of public toilets
	Prevalence of casualties from road accidents
	Facilities to engage in religious and cultural activities
	The coverage from the public transportation
The connectivity to amenities and location-based characteristics	The coverage from the private transportation
	Adequacy of the choices of transportation method
	Coverage of E, A, B, C roads
	Availability of adequate parking spaces within city
	Walkability within the city

The thematic analysis of liveability characteristics and liveability indicators, expose that most of the liveability indicators are similar to the liveability indicators in the global liveability indexes. However, within the identified characteristics, there are indicators such as resettlement of slum households, waste management, and restoration of the ecologically significant areas which are specific to the context of Colombo. Moreover, these indicators are justifiable to most of the emerging cities in the South Asian region because these cities comprise of common set of ground level issues regarding slum households, social security and safety, education facilities and waste management.

Consequently, these liveability indicators should be considered by the planning and policy making authorities when developing propagandas for urban development. For instance, experts point out the ability to make house prices in the urban areas tolerable through developing condominiums with the involvement of the government. Moreover, some interviewees suggest, importance of a constant dialogue with business community to identify the gaps in markets in terms of recreational facilities, hotels, retail shops which enables the government to control demand and supply of construction projects in the market. When planning urban built environment, the slum and shanty resettlement is a sensitive state of affair. Expert on sociology has proposed the slum community should be educated on the benefits of serviced condominium facilities and the parks, play grounds and other attached facilities, prevalence of vector borne diseases and security to their livelihoods and new opportunities through resettlements.

Taken together, these results suggest that the urban built environment planning is a balance of inhabitant's expectations, overall development of the city. This study views urban built environment planning with the perception of liveability because, in short-run a city needs to be liveable to inhabitants. A detailed list of liveability indicators has been derived through the findings which are discussed as significant factors to be considered in urban planning. These factors are not explicitly construction related, but represent socio- economic, ecological and cultural stance of urban built environment planning.

6. Conclusion

In a summary, the significant factors in terms of liveability, that add value to the expansion of urban built environment are identified based on the opinions of experts interviewed. Characteristics such as socio-economic aspects and environment and character of city, promote sustainability while characteristics such as inclusiveness through connectivity, services and other infrastructure represent resilience of the community. Thus, combining liveability concepts with urban built environment indirectly promote sustainability and resilience of the city in the long term. Accordingly, rather than carrying out constructions in urban areas with sole profitability view, the overall liveability of the area highly persuasive to make the constructions effective. The proper balance of the developments in the cities with public parks, housing, services ranging from water supply and electricity supply to schools and recreational areas is the key for the success of the business investments in the cities.

Thus, attention to socio- economic aspects, environment and character of the city, availability, quality and proximity to the services are significant when planning and reshaping the urban built environment. Moreover, the connectivity of amenities and community through increasing walkability, public and private transportation and upgraded infrastructure which facilitate the mobility requirement is viewed as a highly significant yet an area that has not given adequate provisions when improving the urban built environment.

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References

- Atwater, M., Social constructivism: Infusion into the multicultural science education research agenda. *Journal of Research in Science Teaching*, vol.33, no.8, pp.821-837,1996.
- Au, C., and Henderson, J. V., Are Chinese Cities Too Small? *The Review of Economic Studies*, vol. 73, no.3, pp.549-576, 2006.
- Balsas, C. J., Measuring the livability of an urban centre: an exploratory study of key performance indicators. *Planning Practice and Research*, vol.19, no.1, pp.101-110,2004.
- Bracken, G., Introduction Asian Cities: Colonial to Global. *Asian Cities*, pp.13-28, 2015.
- Ellis, P., and Roberts, M., Leveraging Urbanization in South Asia: Managing Spatial Transformation for Prosperity and Livability, 2015.
- Buxton, M., and Tieman, G., Patterns of Urban Consolidation in Melbourne: Planning Policy and the Growth of Medium Density Housing. *Urban Policy and Research*, vol.23, no.2, pp.137-157, 2005.
- Capitanio, M., The Relativity of Liveability Rankings Examining the Japanese Case against the Global Discourse. *World Journal of Social Science*, vol 1, no.5, 12-18, 2017.

- Dittmar, H., and Ohland, G., *The New Transit Town: Best Practices in Transit-Oriented Development*. Washington, DC: Island Press, 2012.
- EIU. Liveability report-global liveability survey, The Global Liveability Index 2018A free overview, A report by the Economist Intelligence Unit. London. Find out more at: eiu.com/wcol, August, 2018.
- Kashef M., Urban livability across disciplinary and professional boundaries. *Front Archit Res.*, vol. 5pp.239–253, 2016.
- Lowe, M., Whitzman, C., Badland, H., Davern, M., Aye, L., Hes, D., and Giles-Corti, B., Planning Healthy, Liveable and Sustainable Cities: How Can Indicators Inform Policy? *Urban Policy and Research*, vol.33, no.2, 2015.
- Maridal, J. H., A Worldwide Measure of Societal Quality of Life. *Social Indicators Research*, vol.134, no.1, 2016.
- Mercer. 2018Vienna tops mercer's 19th quality of living ranking, <https://www.mercer.com/newsroom/2018-qualityof-living-survey.html>, August, 2018.
- Mitchell D., The S.U.V. model of citizenship: floating bubbles, buffer zones, and the rise of the “purely atomic” individual. *Political Geogre*, vol.24, no.3, pp.77–100, 2005
- Mori, K., and Christodoulou, A., Review of sustainability indices and indicators: Towards a new City Sustainability Index (CSI). *Environmental Impact Assessment Review*, vol.32, no.5, pp. 94-106, 2012.
- Peris-Ortiz, M., Bennett, D., and Yábar, D., *Sustainable Smart Cities: Creating Spaces for Technological, Social and Business Development*, Springer, 2017.
- Rayner, J., and Howlett, M., Introduction: Understanding integrated policy strategies and their evolution. *Policy and Society*, vol 28., no. 2, pp.99-109, 2009.
- Setiawan, B., Towards the new urban agenda of safe cities: urban crimes in four Indonesian cities. *IOP Conference Series: Earth and Environmental Science*, vol.99, 2017.
- Saunders, M., Lewis, P., and Thornhill, A., *Research Methods for Business Students*, 8th edition, London, England: Pearson Education. ISBN: 9781292208787, 2019.
- Seto, K. C., Guneralp, B., and Hutyrá, L. R., Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools. *Proceedings of the National Academy of Sciences*, vol. 109, no.40, 2012.
- Shabanzadeh Namini, R., Loda, M., Meshkini, A., and Roknedineftekhari, A, Comparative evaluation of livability indicators of the metropolitan Tehran's districts, *International Journal of Urban Sustainable Development*, vol.11, no. 1, pp. 48-67, 2019.
- Schreier, M., *Qualitative content analysis in practice*, Thousand Oaks, CA: Sage, 2012
- Sohn, D., Residential crimes and neighbourhood-built environment: Assessing the effectiveness of crime prevention through environmental design (CPTED). *Cities*, vol. 52, pp. 86-93, 2016.
- Stevenson, M., Thompson, J., de Sa, T. H., Ewing, R., Mohan, D., McClure, R., et al., Land use, transport, and population health: estimating the health benefits of compact cities, *The Lancet*, vol.388, no. 62, 2016.
- Uitermark, J., An in memoriam for the just city of Amsterdam. *City*, vol. 13, no.2-3, pp. 347-361, 2019.
- UN-Habitat. , Urbanization and development: emerging futures; world cities report 2016. Nairobi, UN Habitat, 2016.
- Valcárcel-Aguiar, B., Murias, P., and Rodríguez-González, D., Sustainable Urban Liveability: A Practical Proposal Based on a Composite Indicator. *Sustainability*, vol.11, no.1, pp.86, 2018.
- Woodcock, I., Dovey, K., Wollan, S., and Robertson, I., Speculation and Resistance: Constraints on Compact City Policy Implementation in Melbourne. *Urban Policy and Research*, vol. 29, no.4, pp.343-362, 2011.
- World urbanization prospects* (ST/ESA/SER.A/352), Retrieved from United Nations website: <https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.pdf>, May, 2014.

8. Biographies

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Udayangani Kulatunga joined Department of Building Economics, University of Moratuwa as a Senior Lecturer in February 2018. Before joining University of Moratuwa, Dr Udayangani Kulatunga was a Reader at the School of the Built Environment, University of Salford UK. She was the Director of the flagship research group, the Centre for Disaster Resilience, University of Salford and the Director for the Centre for Disaster Risk Reduction, University of Moratuwa. She is a Fellow of the Higher Education Academy of UK. Dr Udayangani's research portfolio has two distinct research domains: Performance Measurement and Disaster Management.