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Independence and Interdependence of
Sustainable Spaces

ARCHITECTURAL ATTRIBUTES FOR SOCIAL SUSTAINABILITY
A Framework for Analysing Housing Projects with Special Reference to the Maldives

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Abstract: Social sustainability within the scope of the built environment is largely neglected despite its importance. The research aims to develop a theoretical framework highlighting the attributes of mass housing developments which are critical to social sustainability at a neighbourhood level. This is achieved by identifying the Social Sustainability Key Indicators (SSKI) which can be used to assess the overall social sustainability of four social housing projects in the Greater Male Region, Maldives. The residents of the housing developments were asked to rate their respective mass-housing for the nine SSKIs, the average of which gives the Perceived Social Sustainability Score (PSSS), as well as the level of satisfaction with seven critical architectural attributes which were identified from existing literature, and validated by professionals in the industry. The data from the respondents were then verified using One-way ANOVA, Pearson's r Test of Correlation, and Multiple Linear Regression. The results indicate that a higher mix of land use, better quality housing, and well-planned infrastructure have a positive influence on the PSSS.

Keywords: *Social Sustainability; Architectural Attributes; Sustainable Housing; Mass-housing; Maldives.*

1. Introduction

The United Nations defines Sustainable Development as 'development that meets the needs of the present without compromising the ability of future generations to meet their needs (UN World Commission on Environment and Development, 1987). The concept of sustainable development was first introduced as a social goal elicited by the growing concerns regarding poverty and increasing social inequities, local and global environmental issues, and the realisation that the resources for economic development were finite. These concerns eventually evolved into a focused discussion on the inter-relationship between human activity and the natural environment. The International Union for the Conservation of Nature's Influential World Conservation Strategy (1980) presented Sustainable Development, as a solution to the seemingly incompatible discourse on development versus environmental preservation. Although the economic, ecologic and social aspects were considered the three pillars of sustainability (Kumaraguruparan et al., 2022), the economic and ecological components continue to dominate the sustainability conversation. However, over the past few decades, social sustainability has been gathering more prominence, especially within the scope of the built environment and more importantly in the urban living space. Urban living space includes a variety of urban residential buildings and is a social process influenced by the population growth (Madushani et al., 2021).

This research focuses on the social sustainability of mass residential developments in the specific context of Maldives. The Maldives is a small island nation in the Indian Ocean. Decades of centralised developments has resulted in mass migration to the capital city Male, which is one of the most congested cities in the world. Housing in Male has become hyper-commodified with mass-housing projects by the governments being presented as the only affordable housing option. Thus, in a battle to win the numbers amid the challenge of limited resources, the approach has been further densification.

Despite its significance, social sustainability continues to be an ambiguous term encompassing a broad and multidisciplinary concept relating to the social goals of sustainable development. As a result, it is not possible to assess the social sustainability of an urban environment holistically. Additionally, social sustainability in the Maldivian context is unexplored in academic work. At a time when densification via mass housing is prevalent in the Maldives, there is an urgent need to determine the efficiency of the built forms to meet the needs of current and future generations of Maldivians.

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2. Method of Study

This research is conducted in two parts:

a) Identifying architectural attributes for social sustainability

Content and thematic analysis is done on existing literature to formulate a theoretical framework consisting of social sustainability indicators and physical attributes of the built environment that can facilitate it.

Dempsey (2004) has justified the use of indicators in social science and built environment research, practice, and policy by citing Bryman (2004) as it allows the researcher to assess with limited and representative information.

The establishment of face validity is mandatory due to the subjective nature of some of the concepts in question. A google survey form was shared amongst the professionals in the Maldivian built environment industry. The questionnaire consisted of 12 questions where each architectural attribute was to be measured against each social sustainability indicator on a Likert scale of 1-5. However, the 13 respondents were not sufficient to generate quantitative data. Thus, focus group discussion was carried out with architects and urban planners from the Maldives. During the discussion, the experts were asked to comment on the results of the questionnaire to validate it. In doing so, justifications and explanations were provided for the results. The critical factors and indicators were then selected for the next part of the research. Based on the focus group discussion, seven architectural attributes and nine social sustainability indicators were identified to be highly relevant in the Maldivian context.

b) Validating theoretical framework

The formulated framework was tested by collecting data from residents of mass housing projects. Multilevel data analysis of the quantitative data obtained is done to validate the theoretical framework.

3. Literature Review

3.1 DEFINING URBAN SOCIAL SUSTAINABILITY

Society and the built environment cannot be conceived in isolation as the design and construction of the built environment has a significant impact on the residents and the broader society (Smith et al., 2014). Although several researchers have attempted to define social sustainability within the scope of the built environment, there is no standard definition of social sustainability in the built environment. This is because the topic is approached from several perspectives depending on the discipline being researched (A Colantonio, 2010; Dempsey, 2009).

Some researchers have defined social sustainability as an existing condition or goal that needs to be achieved. For instance, Yiftachel & Hedgcock (1993) defines social sustainability as the "continuing ability of a city to function as a long-term viable setting for human interaction, communication, and cultural development". On the contrary Polese & Stren, (2000) elucidates social sustainability (of a city) as the development which is congruous with the progress of society. The reduction of social exclusion, facilitation of social integration between diverse groups of people, and thus, the improved quality of life for all citizens is emphasised.

Other researchers have defined social sustainability by using principles, dimensions, or indicators that can be used to measure social sustainability. Bramley et al., (2009) define social sustainability to be social equity and the sustainability of community whereas, Woodcraft (2012) defines social sustainability to be about the quality of life in the present and future determined by the extent to which neighbourhoods support individual and collective well-being. Baqutayan, Ariffin and Raji (2015) classify sustainability to be under the love and belonging on the Maslow's Hierarchy of Needs, citing that sustainability is concerned with the emotional needs of people and is, therefore, established by relationships shared between neighbours and the community.

Researchers have also defined social sustainability in terms of two of its crucial principles: focus on the future to improve the society for current and future generations and the maintenance condition where aspects of life are improved for all members of the society. Castillo, Price, Moobela, and Mathur (2007) emphasise ensuring well-being of the current and future generations in their definition of social sustainability. On the other hand, the Canadian Institute of Planners stresses the improvement of living conditions and social integration of all people (Ghahramanpouri et al., 2013). McKenzie (2004) combines these two elements in her definition by stating that it is the "life-enhancing condition within communities and a process within communities that can achieve that condition".

Chiu (2003) elaborates on the three interpretations of social sustainability in the built environment. In the first interpretation, social sustainability is equated to environmental sustainability. The social constraints set by social norms restrict the development within ecological limits. This is considered to be less integrated and dynamic since it does not consider the fluidity of social change. The second interpretation focuses on the social prerequisites of sustainable development such as the structure of the society, values, and norms which dictate how resources within and between generations are distributed. This interpretation stresses the need for society to adapt to ecologically sustainable development. The last interpretation refers to maintaining and improving the lives of the people. Although this is the more popular interpretation, Chiu (2003) argues that the latter two must be combined for the

inability of the present generation to advance ecological sustainability will compromise the well-being and liveability of future generations.

Following this argument, Dempsey, Bramley, Power, and Brown (2011) define socially sustainable places as "places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all".

Larimian et al., (2020) further elaborate on a socially sustainable neighbourhood as a neighbourhood that "provides residents with equitable access to facilities, services, and affordable housing; creates a viable and safe environment for interaction and participation in community activities; and promotes a sense of satisfaction and pride in the neighbourhood in a way that people would like to live there now and, in the future,".

While the definition of social sustainability and urban social sustainability vary from researcher to researcher and is heavily influenced by the key concepts and themes which are being explored in each study, the general trend appears that social sustainability is concerned with meeting the physiological and social needs of the society for the survival of people individually and as a community (Colantonio, 2010). Based on these definitions it is quite clear that the role of architecture and urban design in social sustainability is to create environments that support the social life of the community by facilitating and encouraging social interactions and public participation, conducting educational and skill-building activities, ensuring the safety and security within the premises and supporting social equity, justice and diversity within the community (Ceylan & Soygeniş, 2019).

3.2. PHYSICAL ATTRIBUTES FOR SOCIAL SUSTAINABILITY

Several researchers have attempted to draw on the architectural factors associated with the social sustainability of developments. Markowitsch and Pritzel (1976) have asserted the importance of architecture in creating locality-based social capital, connectivity, regeneration, and economic development. Seven attributes have been recognized to achieve this. They are urban density, social infrastructure planning, connectivity, accessibility planning, public transport provision, place-making, and the virtual connectivity of people and places.

Dempsey et al., (2011) categorised the contributory factors towards social sustainability from existing literature into non-physical and predominantly physical factors. The physical factors are relevant to the design of the built environment such as urbanity, the attractiveness of the public realm, quality of housing, quality of the environment, accessibility, and walkability.

Tim Dixon and Saffron Woodcraft (2013) identify thirteen factors relevant to the social sustainability of housing projects under four categories. The first category is amenities and infrastructure and factors relating to the housing mix, public realm, landscaping, transport connections, and community infrastructure. The second category: social life and cultural life emphasises the aspects relating to the quality of life, perceptions of safety, sense of belonging, and community interactions. Third category: voice and influence refer to civic engagement and participation in the decision-making process and the final category refers to the overall impact of the development on the surrounding neighbourhood and area.

Kefayati & Moztarzadeh, (2015) in their study derived six social sustainability indicators in architecture. They are social interactions (collective memory and social belonging), social participation, social security, flexibility, beliefs and convictions, and architectural identity. Although these factors are relevant to urban and architectural design, the translation of these indicators in design remain rather ambiguous.

Karji, Woldesenbet, Khanzadi, and Tafazzoli (2019) have also identified several factors for urban social sustainability. The factors can be classified into four and focus on the construction industry in addition to the final design product. The four categories are construction and community, health, safety and risk, liveability, and neighbourhood characteristics.

For this research, physical attributes refer to the characteristics of the built environment at the neighbourhood and building scale that dictate the design strategies for a socially sustainable built environment. The attributes were derived from existing literature that has assessed various aspects of social sustainability in built environments. They are land use mix, connectedness and permeability, universal accessibility, provision of communal spaces, quality housing, safety and security, infrastructure planning, legibility, attractiveness, maintenance, and expression of local identity.

3.3. SOCIAL SUSTAINABILITY INDICATORS

Social sustainability indicators measure the progress made in the social sustainability of the society or community. For instance, a higher level of equity and rights being granted to citizens indicate a lower level of wealth disparity, lower crime rates, higher life expectancies, stronger civic engagement, and a sturdier economic vitality (A Colantonio, 2010).

Colantonio & Dixon (2011) highlights a shift in the key concepts from traditional concepts such as basic needs, education, personal development, employment, equity, human rights and gender issues, poverty, and social justice to

'softer' concepts which includes social capital, demographic change, social mixing and cohesion, identity and sense of place, empowerment, health, and safety and even happiness. The latter are more ambiguous and harder to determine and assess.

The concepts and themes from existing literature are tabulated to filter the concepts and themes commonly mentioned. It can be seen that equity and rights, civic engagement, employment, basic needs, safety and security, cultural components, social justice, quality of life, health and wellbeing, accessibility and mobility, walkability, education, and social cohesion are the most popular indicators of social sustainability in the order of popularity. Therefore, these concepts are selected to be Social Sustainability Key Indicators (SSKI).

Table 1, Social Sustainability Indicators in Existing Literature

Key Concepts & Themes	Markowitsch & Pritzel (1976)	Chambers & Conway (1992)	DFID (1999)	Sachs (1999)	Hans-Bockler Foundation (2001)	Thin et al. (2002)	Omann & Spangenberg (2002)	Pope et al (2004)	Baines & Morgan (2002) Sinner et al (2004)	Griessler & Littig (2005)	Bramley et al (2006)	Dempsey (2009)	Dempsey et al (2011)	Hansman et al (2012)	Weingaertner & Moberg (2014)	Kefayati & Moztarzadeh (2015)	Kim & Kwon (2018)	Ceylan & Soygenis (2019)
Equity and Rights		√	√	√	√			√	√					√	√	√		√
Civic engagement	√					√	√		√		√		√					√
Employment				√	√		√						√		√			√
Basic needs					√				√	√						√		√
Safety & Security		√											√	√	√			√
Cultural Components														√	√		√	√
Social justice						√				√				√	√			
Security					√	√					√							
Quality of life													√				√	√
Health & Well-being	√													√	√			
Accessibility & Mobility	√											√			√			
Walkability	√												√		√			
Education							√							√				√
Social cohesion	√									√		√						
Democracy				√	√													
Diversity									√							√		
Livelihood		√	√															
Needs of future generations									√							√		
Empowerment									√							√		
Social capital									√							√		
Social interaction											√					√		
Solidarity						√										√		
Attractive public realm													√		√			
Local democraxy													√					√
Experience							√											
Human rights				√														
Inclusion			√															
Poverty			√															
Pride and sense of place											√							
Social homogenity				√														
Social innovation					√													
Stability											√							
Decent housing													√					
Residential Stability													√					
Settlement efficiency								√										
Common good and hope								√										
Vision								√										

3.4. THEORETICAL FRAMEWORK

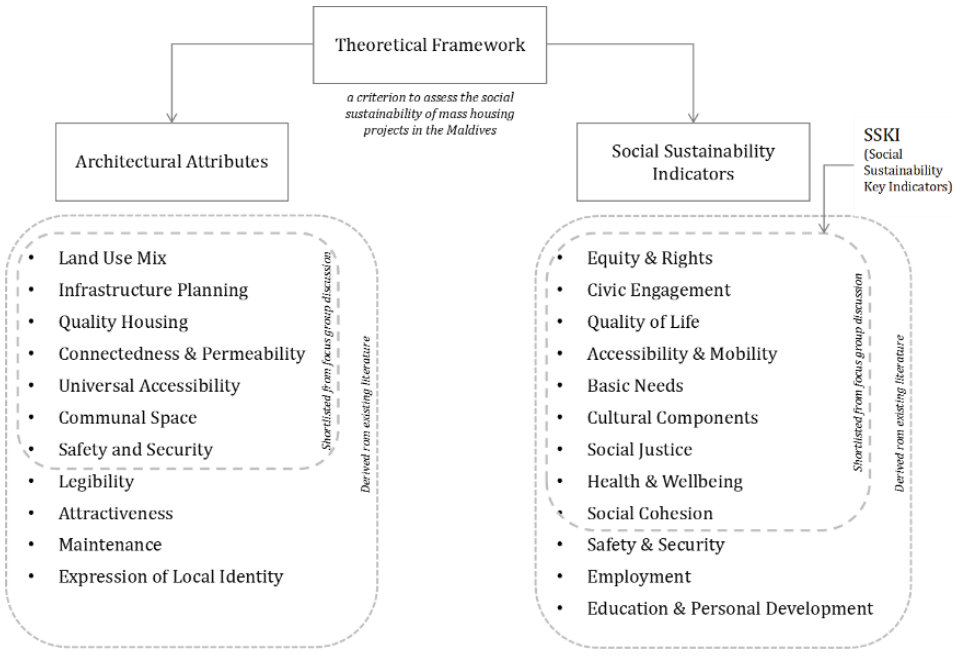

Figure 1, Devising Theoretical Framework

The theoretical framework is derived from literature and verified and shortlisted by experts in the field. It consists of Social Sustainability Key Indicators which are the factors most relevant in measuring the progress of achieving social sustainability in Maldivian neighbourhoods. The average score of the SSKI's give the Perceived Social Sustainability Score (PSSS), which is a measure of the extent to which a neighbourhood appears to be socially sustainable.

The second part of the framework consists of the architectural attributes which are the characteristics of the built environment, and the parameters through which the manifestation of these attributes can be measured.

Table 2, Selected Physical Attributes

Physical Attributes	Parameters to be measured
A1 **Land Use Mix** *Incorporation of different land uses within the specific area*	- Proximity to place of work - Proximity to recreational spaces - Proximity to School - Proximity to other basic Amenities (banks, hospitals, shops, mosques, etc.)
A2 **Connectedness and Permeability** *The connectivity of the neighbourhood and the ease of getting by.*	- Proximity to public transport - Frequent use of public transport - Access to other forms of transportation such as taxis - Walkability of the neighbourhood - Ease of directing people to home
A3 **Universal Accessibility** *Provisions to include differently-abled people in the community.*	-Integration of universal accessibility in the design (provision of wheelchair access, assisted railings, sidewalk braille, etc)
A4 **Communal Spaces** *Provision of spaces that encourage social interaction and engagement sufficiently for the density*	- Provision of open space - Crowdedness of open space - Provision of communal spaces - Provision of areas for children to play
A5 **Quality of Housing** *Assesses the ability to enhance liveability and well-being through the design of the house.*	- Level of privacy within the home - Daylight integration - Natural ventilation - Noise control within the home - Noise control in common spaces - Satisfaction with the spatial layout - Adaptability and flexibility of the home
A6 **Safety and Security** *The perceived safety of the residents in and around the house*	Feelings of safety during the day Feelings of safety at night Feelings of safety in going out alone Allowing children to play outside without parental supervision Awareness on crimes committed in the neighbourhood within the past 12 months
A7 **Infrastructure Planning** *Assesses the density of the housing and the quality of building services and management systems*	- Crowdedness of the neighbourhood - Waiting time to use common spaces and amenities - Issues with services (electricity, water, plumbing) - Satisfaction with the waste management systems - Satisfaction with the design to mitigate risks associated with natural disasters

4. Household Questionaire Survey

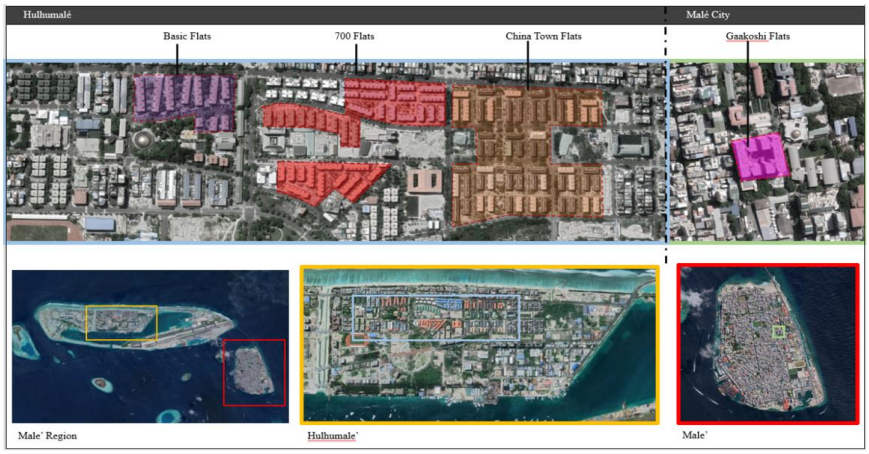

Image 1 - Location Housing Developments

Four social housing developments in the Greater Malé Region were selected based on input from the focus group discussions. The chosen developments are the most recent mass housing projects in the Maldives. The developments vary in their macro and architectural designs so that more generalised data can be obtained.

Table 3- Summary of the case studies

Housing Project	Building Type	Height	Location	Photo
Basic Flats	Walk-up apartments (2BDR ensuite)	4FL	Hulhumalé	
China Town Flats	Walk-up apartments (3 BDR, 2 Bath)	4FL	Hulhumalé	
700 Flats	Walk-Up Apartments (3BDR ensuite)	4FL	Hulhumalé	
Gaakoshi Flats	Mid-rise (3 Bedroom, 2 Bath)	10FL	Malé	

A questionnaire was distributed to 200 households (50 households from each development). Only 100 filled questionnaires were returned. Questionnaires consist of 42 questions to be rated on a Likert scale of agreement. The questionnaire was created in Dhivehi Language to increase the potential survey responses. 50 households from each housing project were approached for the questionnaire survey. To generate probability data, these households were chosen systematically from different floors and buildings with maximum effort to generate representative data. The questionnaires were handed out on a door-to-door survey and the filled forms were collected within the day. Each survey form is intended to represent a household rather than one person. To ensure this, it was requested that the survey forms be filled together to represent the views of the entire household rather than any one person.

The quantitative data from the questionnaire responses were analysed using statistical software. The use of multilevel data analysing software removed erroneous correlations. This was done to mathematically validate the theoretical framework.

5. Findings

Only 50% of the survey forms were returned. Of the survey respondents, 76% were owners and family, and 22% were tenants. The average household size as per the survey was 6.6 people.

Three statistical tests were done to validate the physical attributes which were selected to measure the Perceived Social Sustainability Score. The software IBM SPSS Statistics version 28.0.0.0 was used to do a one-way ANOVA, Pearson's r Test of Correlation, and Multiple Linear Regression test between the selected attributes (A1- Land Use Mix; A2 – Connectedness and Permeability; A3 – Universal Accessibility; A4 – Provision of Communal Spaces; A5 – Quality Housing; A6 – Safety and Security and A7 – Infrastructure Planning) and the Perceived Social Sustainability Score (PSSS).

The One-way ANOVA test compares the means in order to assess the variance within and between groups of data. Based on the results, a statistically significant difference (p<0.05) was found for six attributes. Therefore, the null hypothesis can be rejected for these attributes. A greater F value depicts the unlikelihood of difference between the groups occurring purely due to chance. In order of greater F values, the accepted attributes are A1 ($F_{10,88}$=3.107, p=0.02), A7 ($F_{17,81}$=2.522, p=0.003), A4 ($F_{16,82}$=2.488, p=0.004), A5 ($F_{26,72}$=2.058, p=0.009), A6 ($F_{20,78}$=1.971, p=0.018) and A2 ($F_{18,80}$=1.735, p=0.050).

The Pearson correlation measures the linear association between two variables. A p value less than 0.01 is considered to be statistically significant. The closer to 1 the correlation coefficient, the stronger the impact one variable has on the other. A positive value indicates a positive correlation while a negative value indicates negative correlation. From the results of the correlation test, all the attributes display a positive correlation with PSSS. Since the p value is lower than 0.01, the results are statistically significant. However, only A1 (r=0.401, p<0.001), A5

(r=0.441, p<0.001) and A7 (r-0.515, p<0.01) displayed a moderate correlation while the remaining attributes displayed a weak corelation.

Unlike the correlation test which is done between one independent variable and one dependent variable, the multiple linear regression is done to measure the linear association between PSSS and all the attributes. Sekran (2003) suggests that this takes into consideration the simultaneous effect of several independent variables on the dependent variable. The dependent variable (PSSS) was regressed on independent variables (A1, A2, A3, A4, A5, A6 and A7). A statistically significant regression equation was found (R^2= 0.396, $F_{(7,90)}$ = 8.419, p<0.001). An Adjusted R square of minimum 0.5 is required to validate the model. The lower value (0.396) may be due to the limitations of the research. The F value of 8.419 shows that the attributes have an influence on the PSSS. However, only A1 and A7 have a statistically significant relationship with PSSS (p<0.05).

Table 4 shows a summary of all three statistical tests. The attributes which displayed a statistically significant relationship with PSSS in this model from two of the three tests are A1 – land use mix and A7 – Infrastructure Planning, and A5 – Quality Housing. The results of the statistical analysis align with existing research of social sustainability where focus has been shed on land use mix, quality housing and infrastructure planning (Bramley et al., 2009; Colantonio & Dixon, 2011; Dempsey, 2008, 2009; Woodcraft et al., 2012).

Table 4 – Summary of Findings

A1 **Land Use Mix**				**Decision**
Q1: Proximity to place of work Q2: Proximity to recreational spaces Q3: Proximity to School Q4: Proximity to other basic amenities				Accept A1 for case study analysis
One way ANOVA	**Bivariate Correlation**	**Linear Regression**	**Null Hypothesis**	
($F_{10,88}$) =3.107, p=0.02	r=.0.401, p<0.001	β = 0.054, t = 2.229, p = 0.028	There is no significant relationship between Land Use Mix and PSSS.	
√	√	√	Reject Null Hypothesis	
A2 **Connectedness & Permeability**				**Decision**
Q6: Proximity to public transport Q7: Frequent use of public transport Q8: Access to other forms of transportation such as taxis Q9: Walkability of the neighbourhood Q10: Ease of directing people to home				Reject A2 for case study analysis
One way ANOVA	**Bivariate Correlation**	**Linear Regression**	**Null Hypothesis**	
($F_{18,80}$) =1.735, p=0.050	r=.349 p<0.001	β = 0.004, t = 0.190 p = 0.850	There is no significant relationship between Connectedness & Permeability and PSSS.	
√	×	×	Accept Null Hypothesis	
A3 **Universal Accessibility**				**Decision**
Q11: Integration of universal accessibility in the design (provision of wheelchair access, assisted railings, sidewalk braille, etc.)				Reject A3 for case study analysis
One way ANOVA	**Bivariate Correlation**	**Linear Regression**	**Null Hypothesis**	
($F_{5,92}$) =2.282, p=0.053	r=.0.317, p<0.001	β = 0.020, t = 1.864 p = 0.066	There is no significant relationship between Universal Accessibility and PSSS.	
×	×	√	Accept Null Hypothesis	
A4 **Communal Space**				**Decision**
Q12: Provision of open space Q13: Crowdedness of open space Q14: Provision of communal spaces Q15: Provision of areas for children to play				Reject A4 for case study analysis
One way ANOVA	**Bivariate Correlation**	**Linear Regression**	**Null Hypothesis**	
($F_{16,82}$) =2.488, p=0.004	r=.0.379, p<0.001	β = 0.023, t = 1.379 p = 0.171	There is no significant relationship between	

			Universal Accessibility and PSSS.	
√	×	×	Accept Null Hypothesis	
A5 **Quality Housing**				**Decision**
Q16: Provision of privacy within the home Q17: Daylight integration Q18: Natural ventilation Q19: Noise control within the home Q20: Noise control in common spaces Q21: Satisfaction with the spatial layout Q22: Adaptability and flexibility of the home				Accept A5 for case study analysis
One way ANOVA	**Bivariate Correlation**	**Linear Regression**	**Null Hypothesis**	
($F_{26,72}$) =2.058, p=0.009)	r=.0.441, p<0.001	β = 0.020, t = 0.871 p = 0.386	There is no significant relationship between Quality Housing and PSSS.	
√	√	×	Reject Null Hypothesis	
A6 **Safety & Security**				**Decision**
Q23: Feelings of safety during the day Q24: Feelings of safety at night Q25: Feelings of safety when going out alone Q26: Allowing children to go outside to play without parental supervision Q28: Aware of crime committed in the neighbourhood within the past 12 months				Reject A6 for case study analysis
One way ANOVA	**Bivariate Correlation**	**Linear Regression**	**Null Hypothesis**	
($F_{20,78}$) =1.971, p=0.018)	r=.0.352, p<0.001	β = 0.013, t = 0.751 p = 0.454	There is no significant relationship between Safety and Security, and PSSS.	
√	×	×	Reject Null Hypothesis	
A7 **Infrastructure Planning**				**Decision**
Q29: Crowdedness if neighbourhood Q30: Waiting time to use common spaces and amenities Q31: Issues with services (electricity, water, plumbing) Q32: Satisfaction with the waste management system Q33: Satisfaction with the design to mitigate risks associated with natural disasters				Accept A7 for case study analysis
One way ANOVA	**Bivariate Correlation**	**Linear Regression**	**Null Hypothesis**	
($F_{17,81}$) =2.522, p=0.003)	r=.0.515, p<0.01	β = 0.049, t = 2.044 p = 0.44	There is no significant relationship between Infrastructure Planning, and PSSS.	
√	√	√	Reject Null Hypothesis	

5.1. ASSUMPTIONS AND LIMITATIONS OF THE STUDY

A limitation of the research is that only limited architectural attributes were selected for the study. These attributes were shortlisted through the focus group discussion held with architects, urban planners, and engineers. As is indicated by the adjusted R square from the multilinear regression model, the selection of more attributes will make the model more reliable and factors that may not have been considered significant in the focus group discussion may have been significant contributors to social sustainability. Another delimitation of the research is that an average of nine questions were used to calculate Perceived Social Sustainability Score (PSSS). Each of the nine questions was used to assess a social sustainability key indicator that is broad and ambiguous. More questions can be included to increase the accuracy of the PSSS. Finally, only 50% of the questionnaires distributed were returned. Therefore, the sample size is lower than expected. Increasing the sample size will also increase the validity of the model.

6. Conclusion

Social sustainability is increasingly used by governments and policy-makers in making informed decisions about urban development, regeneration, and housing (Woodcraft, 2012). However, there is limited knowledge of the application of social sustainability in architectural products. This lack of knowledge is especially notable in the Maldivian context despite the rapid urbanisation and development. This research has attempted to fill the gap by developing a criterion to assess the social sustainability of housing developments in the Maldives.

In this attempt, it was observed that all chosen architectural attributes correlate positively with the PSSS. The stronger attributes that can significantly improve the social sustainability of housing developments are identified as the integration of mixed land use, provision of quality housing, and planned infrastructure. To achieve this end, a base list was filtered through rigorous processing using different methodologies and the expertise of several individuals to shortlist only the most influential architectural attributes in terms of social sustainability. Therefore, the devised framework is verified theoretically, practically, and statistically. The findings of the research can contribute to the policy discourse on the sustainability and resilience of Maldivian cities.

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