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Determinants of Place Attachment: Comparative Study of Horizontal and Vertical Middle-Income Residential Environments in Sri Lanka

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Abstract--- *The main objective of this research is to examine the determinants of place attachment of horizontal and vertical residential environments (specifically at neighbourhood level). Place attachment determinants and its scale were formulated by reviewing literature: 16 variables (social and physical determinants) were identified. Structured questionnaire survey was conducted to collect data from 200 residents of each residential environment in fast growing Colombo Metropolitan Region in Sri Lanka. The gathered data were subjected to statistical analysis in Statistical Package for the Social Science (SPSS). According to the results, the level of place attachment of horizontal residential neighbourhood is higher than the vertical residential neighbourhood, while respondents of both neighbourhoods indicated more than average level of attachment. Regression analysis shows that, in both neighbourhoods, both physical determinants and social determinants appear as significant determinants to explain the changes in place attachment. Moreover, residents of vertical residential area feel more attached to the place due to physical determinants, whereas, the residents of the horizontal residential area feel more attached to the place due to the social determinants. The comparison of two types of neighbourhoods might provide additional insights into place attachment. The result of this study can be useful for planners, architects and policy makers when planning the different types of residential environments.*

Keywords--- *Place attachment; determinants; residential neighbourhoods*

I. INTRODUCTION

Place attachment has become an important part of human existence. It has emerged from an intersecting landscape of research that have grown together and inspired by each other's commonalities. For instance, place attachment has become a central theme in many disciplines such as rural community planning [1]; social housing [2]; interactive architectural designs [3]; urban planning [4]; environment management [5], and psychology studies [6,7,8]. Among them, the tripartite model—person, psychology, place—can be identified as the mostly discussed piece of literature.

Many studies consider place attachment as a positive phenomenon, particularly in residential environments. Galster and Hesser's [9] view that strong neighbourhood attachment to an area can experience better maintenance. Brown, Perkins, and Brown [10] demonstrated that households who have higher level of place attachment, can have

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physical improvement in their neighbourhoods. Authors suggested that potentially, existence of these bonds, more importantly, the way activating this attachment through collective action, can improve residential environment quality. Lewicka [11] found that place-attached persons, compared to non-attached ones were more satisfied with their life overall. Yet, place attachment is unidentified variable, being associations among place attachment and other variables are correlational rather than a cause and effect [12]. Further, 'little empirical progress has been made compared to what was known 30 or 40 years ago' (ibid).

Creating and maintaining quality residential environments is a global issue. Sri Lanka is no exception. Public housing stock for middle income earners that has been developed in early 1980's is aging and thus, redevelopment and management is inevitable. In addition, under the new urban development agenda, Sri Lankan government has taken up steps to facilitate private sector to develop housing for middle income earners. Thus, public and private housing development and redevelopment require careful concern on design, services, safety, and management, ensuring good places to live, in both high-rise - vertical neighbourhoods and low-density single house – horizontal neighbourhoods.

Recently, scholars of many countries, for examples, China [13], Turkey [14], India [15], Iran [16], Israel [17] and so forth, started to pay attention on place attachment in relation to residential areas. Despite that contextual understanding about place attachment is worthy, to authors' knowledge, where there is no research attempt recorded yet in Sri Lankan context.

Moreover, the prevailing research works related to residential neighbourhood attachment are confined either to horizontal layouts [16, 18, 19, 20] or vertical layouts [21, 22, 23, 17, 15]. At the same time, there are no comprehensive research studies devoted to study the place attachment of horizontal and vertical residential areas comparatively.

Against this backdrop, the present study aims to examine the determinants of place attachment together with the levels of place attachment in vertical and horizontal residential neighbourhoods. Places of the present research are the residential environments (specifically at neighbourhood scale) —Soysapura and Mattegoda —located in Colombo Metropolitan Region, Sri Lanka (Figure 1).

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Figure 1: Location of case studies

II. LITERATURE REVIEW

A. Key determinants of place attachment

Brown and Perkins [6] defined place attachment as 'positively experienced bonds, sometimes occurring without awareness, that are developed over time from the behavioural, affective and cognitive ties between individuals and/or groups and their socio-physical environment'. Hesari et al. [16] tried to interpret place attachment as a notion that floats between people and their spatial setting. A review of articles (Table 1) shows that place attachment correlates with number of factors and present both social and physical dimensions, when the place of interest becomes the neighbourhood.

Accordingly, to the literature reviewed, place attachment consists of three indicators—(a) residents' willingness to represent their neighbourhood (proud of my neighbourhood) [12]; (b) residents are satisfied with their neighbourhood (Ideal neighbourhood) [24]; and (c) residents' desire to leave the neighbourhood (hard to leave) [24].

Moving one step ahead, Casakin and Reizer, [17]; Muhuri and Basu, [15] attempted to identify place attachment through social and physical determinants such as social bonds and access to physical infrastructure. Except for these key determinants, studies also considered demographic factors such as age [25, 12], marital status [15], education level [26] and occupation [17] in selecting case studies to evaluate the determinants. Yet, none of the studies have tried to evaluate both social and physical determinants to compare two different residential neighbourhoods with two different housing layouts i.e., vertical and horizontal residential neighbourhoods.

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III. METHODS

The study adopted five step methodological approach in the process of the research. Initially, study conducted a comprehensive literature review to identify the key determinants of place attachment. Fifteen highly cited articles were selected for this exercise (Table 1).

Table 1: Identification of determinants

Variables	*27*	*16*	*13*	*17*	*15*	*28*	*29*	*30*	*31*	*26*	*32*	*33*	*12*	*25*	*34*
D1- water supply										x		x			
D2-electricity supply									x	x					
D3-drainage										x					
D4-avilability of health facilities	x			x		x	x	x	x	x			x	x	x
D5-satisfy the distance to the working place		x		x				x	x	x				x	
D6-satisfy the distance to the schools		x				x	x	x	x			x		x	x
D7-satisfy the distance to town centres			x	x	x	x				x	x	x	x	x	x
D8-recreational areas	x	x				x			x	x	x	x	x	x	
D9-housing design	x								x	x	x		x	x	
D10-maintain common facilities		x		x		x		x	x	x			x		
D11-satisfcation about relationships	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
D12-feeling of living in a safer neighbourhood			x	x	x	x	x		x	x	x	x	x	x	x
D13-residence care about others	x	x	x	x	x	x		x	x	x	x	x	x	x	
D14-helpful neighbours	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
D15-active participation	x	x	x	x	x	x	x	x	x	x		x	x	x	x
D16-willingness to organise events and festivals		x	x		x	x	x		x	x		x	x		x

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Secondly, two middle income public housing schemes—vertical and horizontal (developed in 1980's)—were selected as case studies (Figure 1). Thirdly, a questionnaire survey was conducted in the aforesaid residential neighbourhoods. Questionnaire was formulated to evaluate the dependent variable (degree of place attachments) and independent variable (16 determinants) derived through the literature review. Study used a questionnaire survey to collect data from 200 residents from the Soysapura and Mattegoda housing schemes. Respondents rate each item on a 5-point Likert-type-scale ranging from "strongly disagree" to "strongly agree" for social determinants and "very poor" to "very good" for physical determinants.

Fourthly, an independent sample t-test was done by using the data sets to understand the levels of place attachments in two case studies. Fifthly, regression analysis followed by correlation analysis, Principal Component Analysis (PCA) and factor reliability testing were done to identify and quantify the significant contribution of the social and physical attributes to place attachment.

IV. RESULTS

4.1 Demographic factors

Of the 100 respondents of Soysapura (vertical) housing schemes interviewed, 64% were male. Over 80% of the responders were married. In terms of occupation, 52% of respondents worked in the private sector, 28% worked in the public sector. 38% of the respondents were between the age of 34 – 54. Accordingly, majority of people who were actively engaged in the labour force expressed their views in this study. About 38% of the respondents have received an education up to Ordinary Level, and 39% of the respondents have studied up to Advance Level and 22% completed a degree.

Of the 100 responders of Mattegoda (horizontal) housing schemes interviewed, 43% were male, and 87% of the respondents were married. In terms of occupation, 53% of respondents worked in the private sector, while 23% worked in the public sector. Most of the respondents (45%) were aged between 34 – 54. 37% of the respondents have received Ordinary Level school education and 31% of the respondents have studied up to Advance Level. Also, 32% of the interviewees were graduates. However, both these case studies reflected more or less similar demographic features in terms of gender, marital status, occupation and education level.

4.2 Level of place attachment

As the study objective is to compare the place attachment levels in vertical and horizontal housing schemes a mean value of three place attachment indicators was computed and comparison of the two cases was undertaken. An independent sample t-test was conducted for that purpose.

As per the independent sample t-test results, there is a significant (p 0.000) difference in the scores in between the place attachment level of the two cases, which specified considerably a high place attachment level in Mattegoda housing scheme. Respondents of both neighbourhoods indicated that level of place attachment is more than average [Soysapura (mean 3.9; SD .823) and Mattegoda (mean 4.2 and SD .436)].

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4.3 Determinants of place attachment

Before undertaking the regression analysis, as in Figure 2, a correlation path diagram was developed (based the correlation analysis) to understand the correlation among the indicators (Figure 2). In Soysapura housing scheme, the three indicators that present place attachment reflect a high correlation value.

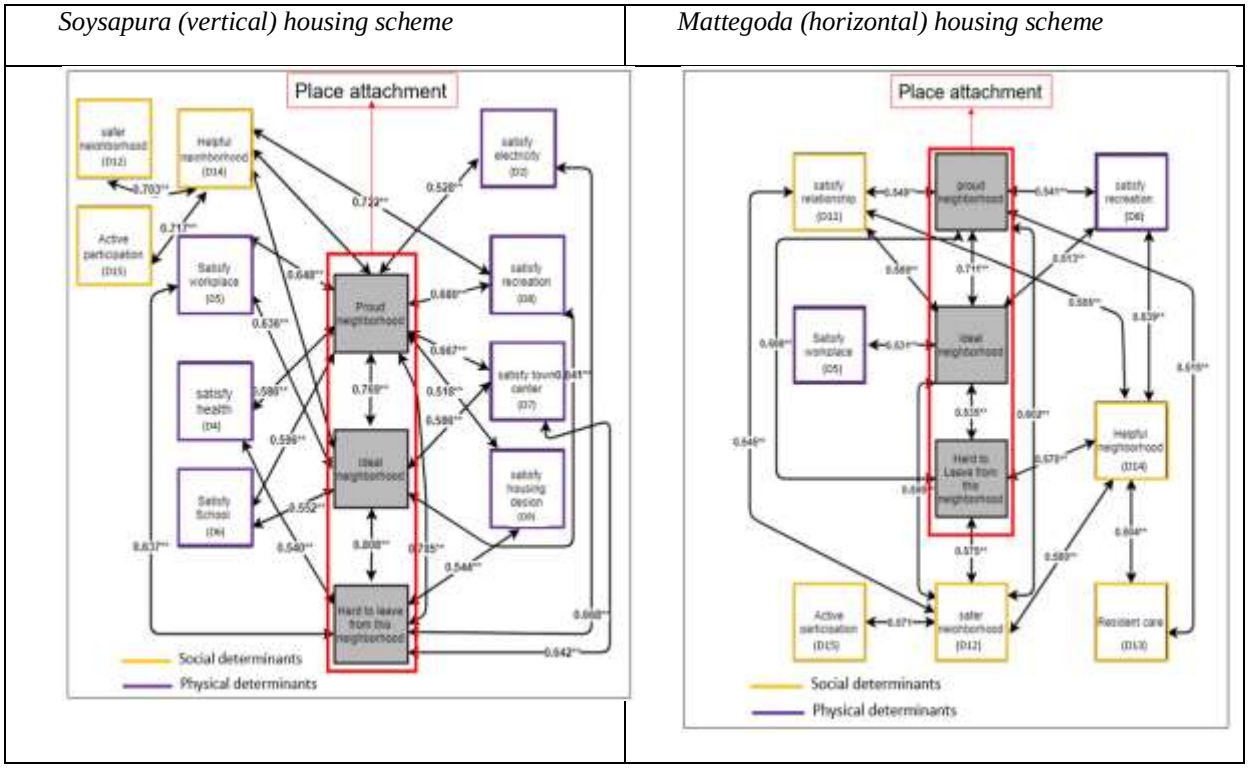

Figure 2: Correlation flow path diagrams

From the sixteen determinants, ten determinants were significantly correlated. Out of ten, seven are physical determinants; (a) D2—satisfying electricity; (b) D4—availability of health facilities; (c) D5—satisfying the distance to workplace; (d) D6—satisfying the distance to school (e) D7—satisfying the distance to town centre (f) D8—satisfying recreation; (g) D9—satisfying housing design. The balance three are social determinants; (a) D12—safer neighbourhood; (b) D14—helpful neighbourhood; (c) D15—active participation. In Soysapura housing scheme, as far as physical determinants concerned the highest correlated items are the D8—satisfying recreation (0.68), D7—satisfying the distance to town centre (0.67), and D5—satisfying the distance to workplace (0.64).

When consider the social determinants, D12—safer neighbourhood, has a weak correlation (0.21, p<0.10) with the three indicators of place attachment. Other social determinants such as D11—satisfy relationship with neighbours, D13—residents care about others—represented 0.17 (p<0.1), and 0.28 (p<0.1) correlations respectively and thus it is not presented in the Figure 2. Notably, the D12— safer neighbourhood and D15— active participation does not have a direct correlation with the three indicators of place attachment, but it is highly correlated with the D14— helpful neighbourhood.

In Mattegoda housing scheme, as shown in Figure 2, the three variables that present place attachment reflect a

significant correlation. From the sixteen social and physical determinants, seven determinants are highly correlated with the three variables of place attachment. From the seven highly correlated determinants five are social determinants. Among these D11—satisfying relationships and D14—helpful neighbourhood determinants indicated the highest correlation. For instance, D11—satisfying relationships, correlate with the two place attachment variables of proud neighbourhood and ideal neighbourhood. Further, D14—helpful neighbourhood and D12—safer neighbourhood, correlate with the place attachment variable of—hard to leave from the neighbourhood (0.57). Unlike the Soysapura housing scheme, physical determinants were weakly correlated with the Mattegoda housing scheme. D5—satisfy the distance to workplace and D8—satisfy recreation are correlated with the variables of place attachment.

Principal Component Analyses were carried out on each case studies to verify their factorial structure. The item loading less than 0.50 supposed to be eliminated, but all indicators were more than 0.50 (Table 2) and 3 components named as 'physical determinants' item 1, 'place attachment' item 2 and 'social determinants' item 3. Cronbach's alpha is then calculated to test factor reliability. In order to assess the sufficiency of the internal consistency, Malhotra and Birks (2003) suggested that a value of 0.6 is acceptable in exploratory research. Thus, the values in Table 2 records more than 0.60 which, confirmed the internal consistency reliability of factors.

Table 2: PCAs Matrix

	Soysapura (vertical) housing scheme				*Mattegoda (horizontal) housing scheme*			
	Component			Cronbach's Alpha	Component			Cronbach's Alpha
	1	2	3		1	2	3	
A1		0.820		0.682		0.804		0.798
A2		0.757				0.754		
A3		0.805				0.745		
D1	0.589			0.725	0.503			0.798
D2	0.676				0.710			
D3	0.623				0.673			
D4	0.750				0.706			
D5	0.739				0.737			
D6	0.770				0.832			
D7	0.760				0.712			
D8	0.845				0.851			

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D9	0.687			0.713		
D10		0.687	0.724		0.619	0.609
D11		0.666			0.637	
D12		0.720			0.470	
D13		0.691			0.706	
D14		0.673			0.624	
D15		0.741			0.540	
D16		0.687			0.634	

Regression analysis have been performed to examine how social and physical factors determine the place attachment. Table 3 presents the parameter estimations for two case studies. The results revealed that, in the both cases, the both physical and social determinants are significant predictors of place attachment [Mattegoda (R^2= .31, p <.01); Soysapura (R^2= .59, p < .01)]. In Mattegoda housing scheme, social determinants (β=.45, *p*<.05) predict place attachment more than physical determinants (β=.23, *p*<.05). The respondents of Mattegoda housing scheme has further confirmed this finding, for example, one respondent mentioned: '*We are happy to live in this permanent house more than 45 years due to the quiet surrounding and safety of the place; We have good relationships with other neighbours hence we talk often to next door and close neighbours in our neighbourhoods*'.

Table 3: Regression analysis

	Mattegoda		**Soysapura**	
	B	***t***	***B***	***t***
(Constant)	-1.506*	-1.893	-1.283**	-2.774
Physical	0.237**	2.726	0.715**	10.826
Social	0.452**	5.206	0.175**	2.643
R square	0.312		0.596	
Adj R square	0.298		0.587	
Std error estimate	0.63537		0.67388	
F	22.041		71.416	

*Significant at the 0.1 level; **significant at the 0.05 level.

In Soysapura housing scheme, physical determinants (β=.71, *p*<.05) were found to be very important in predicting place attachment than that of social determinants (β=.17, *p*<.05). Respondents' perceptions further justify the quantitative finding: '*we are living in this neighbourhood only for the job and educational places which are close to us; we are migrated to this neighbourhood and live long as this neighbourhood is located next to the Galle*

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Road and we can access to the services quickly'. This is perhaps partly due to fact that they could enjoy more urban facilities compared to Mattegoda housing scheme.

V. DISCUSSION AND CONCLUSION

The study presented in this paper contributes to broaden the perspective related to the social and physical determinants of place attachment.

Initially, the study resulted bringing forth sixteen social and physical determinants which can be used to define levels of place attachment. These determinants have direct and indirect correlations with the place attachment.

Secondly, the study disclosed some key determinants that are highly correlated to make residents more attached to their neighbourhood. Accordingly, Soysapura and Mattegoda housing schemes reflected somewhat different results. Regression analysis confirmed that the both physical and social determinants are significant predictors of place attachment in both cases, though the degree of contribution of each predictor differs. Soysapura residents become more attached to their residential area due to physical determinants, while Mattegoda residents become more attached to their residential area based on the social determinants. Further, it is confirmed that residents of horizontal neighbourhood (Mattegoda) are more attached to their residential area than the vertical neighbourhood (Soysapura). Mattegoda Residents' reflections, for example, 'We live in this place, because this is a quiet and safer neighbourhood' further justifies the aforesaid argument.

The study identifies place attachment as a complex notion which demand more empirical investigations in different contexts. This study shed lights on the tripartite model introduced by Scannell and Gifford [8], which introduces ground level socio – physical determinants to define the placed dimension.

Further, this study might be treated as an initial attempt to examine both horizontal and vertical housing schemes comparatively. The study results corroborate the findings of the Lestari and Sumabrata [18], and Najafi et al. [19]: Social determinants were found to be the most significant predictor of place attachment related to horizontal housing schemes. However, Bahar [23], Muhuri and Basu [15] and Clark et al. [30] analysed vertical housing schemes which ended up in contradictory results. Bahar [23] and Clark et al. [30] found the significance of physical determinants in making residents attached to their residential neighbourhood. Muhuri and Basu [15] identified neighbourliness as one of the key determinants of place attachments.

At present, most of the countries including China, India, Sri Lanka—are engaged in a process of introducing vertical housing units to address the housing issues of the country. Results of the present study suggest that it is important the creation, regeneration and management of residential environments should take care of local residents' socio-physical concerns which feel them attached to their places of living.

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