Critical Determinants of Residential Land Values in a Suburban Area: A Perception Analysis

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Abstract

Residential land is a crucial factor for human beings in any country. Along with the rapid urbanization, the value of residential land is increasing gradually which sometimes the values are unreachable in some places. There is no evidence of research on what factors that are contributing to this escalation of land prices in Moratuwa, one of the suburban areas of the city of Colombo in Sri Lanka. Hence, the main intention of this research is to identify the important determinants of residential land values in the Moratuwa Municipal Council area. Data was collected from two groups, i.e., the residents and professionals who work with land values including three property valuers and a bank manager. An online questionnaire survey was used to collect data from residents selected through the purposive sampling method while semi structured interviews were conducted with professionals. The analysis proceeds with both quantitative and qualitative approaches. The results of the quantitative analysis used for residents' views show that the factors of location, neighbourhood characteristics, accessibility, and topographic characteristics are significantly influence on land value. The results of the content analysis applied for professionals' views were very close to the results of resident's views and confirm that the location and neighbourhood characteristics and accessibility are significant

on land values. Accordingly, the factors of location, accessibility, and neighbourhood characteristics are having a significant impact in terms of determining the residential land values in the Moratuwa MC Area and interested parties are advised to consider them in all transactions on residential lands.

Keywords: residential land value, location, neighbourhood characteristics, suburban area

INTRODUCTION

All sorts of property development activities begin with land. The main element in selecting how to utilize this natural resource is its value, and it is fascinating to note that value considerably varies from place to place. Generating income from property assets is lower in developing countries compared to developed countries. Binoy et al, (2022) noticed this is mainly due to the non-availability of data related to relevant transaction. Location, or more specifically, geographic location, plays a key role in determining the value of land. People are constantly eager to dwell in the most alluring and convenient areas. Conversely, it can be considered as the most demanded factor. More than that, there are several other elements that influence estimating the value of land. According to Manganelli et al., (2013), in urban areas the balance between supply and demand cannot be adjusted by nature because the local context, in the opinion of market participants, is uniform in terms of infrastructure including access to public services, access to public transport, availability of basic commercial services, etc.

Since the land supply is fixed, the land value in urban areas is determined by the huge demand for space. It depends on the location's accessibility, the quality of the facilities, and the geography in urban regions (Brigham, 1965). Buyers take into account both tangible and intangible characteristics because they want to be able to live in the property they purchase until they life ends or until a transaction takes place to change the ownership. Hence, the place must be safe and secured to the satisfaction of the buyer. This depends on fewer crimes and a pleasant environment. In modern society, it is important to look at the structural residential locations when planning

sub-urban areas for development. People wish to live outside congested areas with rural characteristics. However, in developing countries, a large proportion of the population works in urban areas because they seek employment opportunities in urban areas. Given that they are paid a medium pay in all respects, it is imperative that they balance their income with the satisfaction of their requirements and expectations. Thus, living in the suburbs is found to be worth more than settling in the centre. If land values are increasing even in the suburbs, people get frustrated in trying to find a better living place.

A similar situation is observed in Sri Lanka, as supported by the push, and pull factors in the urban areas, more people from the rural areas are migrating to the cities, and they seek to settle close to the urban areas. Based on the increasing population and recurrent demand, it is noted that the capital city of Colombo is overflowing with a variety of mixed activities. Almost all the land plots have been occupied, thus the land values are very high and can be reached by those who search for land. As a result, people are looking for residential blocks outside of Colombo, and this demand is currently shifting to suburban areas. It is observed that in the suburban areas, the residential land values are also increasing. There are many factors contributing in determining the residential land value. Researchers have evaluated the determinants of land values, taking mostly the physical features such as land size, proximity to facilities, etc., into account. However, there are many factors that affect residential land value apart from the main physical factors.

There is no evidence of research being done on the Moratuwa suburban area to test the determinants in a holistic view covering physical, social, and environmental factors, especially as an area which is enriched with several natural features such as the Bolgoda Lake, Kirala Island, Lunawa lagoon, and boarding to sea. Therefore, the main focus of this research is to assess the critical determinants of residential land value through the perception of both the residents and the professionals' point of view in a sub-urban area of Moratuwa. The outcome of this study will be useful in providing a vast knowledge of factors' effects on land value and will be useful to planners, developers, and residents.

LITERATURE REVIEW

Land, Land Value and Residential Land Value

Land differs from other economic assets in that its supply is stable, each parcel of land has a stabilized position, which is a unique attribute, and the use of a parcel of land influences the usage and value of adjacent parcels (Clark, 2006). The last attribute often known as an externality of land use invariably necessitates government involvement. As a result of all of these factors, "the use and ownership of land include an extraordinarily complicated mix of interests, rights, and tenure" (Davy, 2012). Thus, in the urban region, even though the land cannot immediately present any goods, the exceptional qualities of the uniqueness in the location equip it with the status of a rare commodity.

Prices for land and property can relate to either the amount requested (asking prices) or the amount acquired (bid prices). Land and property values, on the other hand, are price estimations based on emotional assumptions and perceptions of worth." In a well-functioning market, value is likely to correlate to price (Roberts, 2008). The open market value indicates the exchange value, which is an assessment of the best price at which the land or property may fairly be anticipated to sell given certain conditions (Chun, 2018). The prices spent in recent open market activities must be properly accounted for to assess open market worth. The many uses of urban property may have a positive, negative, or neutral impact on neighbouring properties (Bandt et al., 2010). The value of urban property is composed of an extraordinarily complicated combination of assets, entitlements, and occupancy of land use and ownership. Landowners or users usually strive for the maximum and best usefulness of the land if it were unoccupied and accessible for growth under market forces (Franco, 2016). Due to interplay of diverse operations at different sites, such development may have an influence on the concerns of other property owners/uses. For instance, the potential worth of any slice of land can be significantly restrained by destructive activities occurring on neighbouring property; it is also conceivable that the optimum use or land value might be achieved by locating land in the most resource-efficient area.

Potential returns in an urban or suburban context are primarily related to the type and nature of structures that may be built on the site, as well as the facilities that can be provided from them: business, commerce, residential, social utilities, and so on (Millington et al., 2018). Residential property is a form of wealth as well as a significant influencing element in the cost of living for landowners who live in or on their land. The cost of a home is distinct from the cost of the functions it delivers, while the two notions are obviously intertwined. Such connections, which comprise both the physical landscape and the living context, make up the living spaces for residential land (Jennings et al., 2019). The activities in the residence are challenging. Different land uses offer the setting for these behaviors, which are in theory pooled by the entire urban area. However, only the land uses that are most close by can fulfil most of the daily needs of each residential land (Bond et al., 2013). All these significant land uses comprised the living environment for residential property. Because the living conditions of all residential areas cannot continuously be the identical, the impact of diverse land uses on residential property value will differ from one another. The amount to which various land uses can impact residential property value is determined by how their activities influence the appeal to inhabitants, particularly its surroundings in pleasing people (Stein Fuhrer et al., 2016). The scarcity of land raises the likelihood of higher rents, which is reflected in increased housing costs. High housing costs stimulate capital land substitution in housing development, which leads to an increase in housing output.

Factor Affecting on Residential Land Value

Urban designers, economists, and others fascinated in urban issues frequently prefer researching the configuration of urban land uses and the impact of various qualities on land value. The initial attempts are mostly focused on gaining exposure to basic occupations. Later, in the residential location experiment, access to additional non-work options is incorporated as an explanatory variable. Krajewska et al, (2021) pointed out that the land with defined development conditions is having high values than that lands with no development conditions. Roberts, (2008) sought to evaluate householders' readiness to spend for "housing," particularly tranquility. Baranzini et al., (2008) utilized a sample of residences in the Boston

Regional area's action routine to calculate each member's projected maximum benefit. An interesting feature noted by Ondiek et al, (2020) is that the socio-economic factors of human beings tend to change the land uses such as conversion of wetlands into housing blocks. Location access, which largely refers to the ease of access to occupations, shop jobs, and green space, is employed as a significant predictor for property value and residential location modelling in the study by Li and Chau, (2016). It is also discussed that the disaster history, concentration of commercial establishments, and permissible FAR are the major factors affecting land value while water frontage and noise pollution have a reverse relationship Binoy et al, (2022). Most of them agree that further study is needed to fully understand this link and that applicability to other geographies and land uses would be beneficial. For instance, access may be to jobs, shopping malls, parks, reputable institutions, vistas, or other attractions. It is usually better to quantify these parameters explicitly in the model, even when a parameter such as distance to the CBD is a reasonable proxy for plot size, location, zoning regulations, and planning limitation considerations. The magnitude of the impact of location, accessibility, zoning, and topography on land values is the primary focus of this article in addition to these other aspects.

Location

Housing units are positioned on site and so vary in terms of their surrounds, the form of the area where they are located, and their proximity to work possibilities and market locations; hence, the importance of location on the housing market cannot be overstated. According to classic economic theory, location is the driving factor influencing the value of urban land (Gaca, 2018; Shen et al., 2018). According to Gloudemans, (2002) houses in the same community have comparable location, economical, and social features. As a result, while estimating the influence of housing quality qualities on home prices, the characteristics of the residential site must be thoroughly investigated and analysed. Callahan, (2017) also argued that localized negative factors such as disturbance might have a detrimental impact on housing prices. He emphasized that residences located near hazardous waste sites, high voltage power transmission lines, or flood zones are likely to decrease values.

H1: Location is significantly affected to residential land value

Accessibility

Many residential placement models are based on accessibility considerations. Accessibility denotes simple (e.g., inexpensive and quick) transit between land use events. Proximity to major highways is a key determinant according to Binoy et al (2022). Morales et al. (2019) studied the impact of various forms of accessibility on land value in Guatemala City. According to Neibner, (2019) depending on the sort of land-use scenario, the attraction of various functional requirements (e.g., home position and property prices) can be used to some form of gravity metric. Accessibility indicators are stated in a variety of ways, such as ranging from basic minimum travel-time indicators to measurements of accumulation possibilities within a given distance or time parameters, to optimum utility assessments. However, the most used access benchmark is the time and distance connection between a residence and other community amenities. Hence, Yesmin, (2013), defines access as the link between activity demands and impediment (e.g., time, money, the resident's will). According to Suzuki et al., (2015), the natural border, such as the river, can be a significant impediment to accessibility; nevertheless, with the departure of a newly built bridge, it can offer anomalous favourable evaluation to the neighbouring residential area.

H2: Accessibility is significantly affected to residential land value

Zoning Characteristics

Land zoning policy is a topic that has received a lot of attention in the literature. Merriam, (2004), for example, give an assessment of theoretical and empirical works on zoning policy and suggest a classification of various regulatory devices. Gyourko et al. (2008) presented the first endeavour to standardize the scope of planning and zoning regulatory settings in the United States by presenting an integrated land use management index. Most crucially, Lee, (2002) are the first to demonstrate that using conditional development restrictions to create a welfare-maximizing structure in urban development can allow for conclusions from

data that would not otherwise be clear. This is also seen in the prior research of Clapp, (2002) and Fuss, (2015) which effectively employ zoning regulatory restrictions to explain land price variances. Aside from man-made zoning regulatory constraints, natural constraints such as mountains and lakes have an important impact in housing supply and home pricing. None of this research expressly separates land values or takes land condition into consideration in terms of the Floor Area Ratio (FAR). In addition, our research looks at the FAR $_{max}$ as a land use control with a straightforward economic understanding. The reason for this is that the FAR $_{max}$ is a direct assessment of possible floor space based on land size (Price, 2017).

H3: Zoning characteristics is significantly affected to residential land value

Topographic Characteristics

The topography of a region may have a significant influence on real estate development and can be an important aspect in market research. Topography can have an impact on concerns such as runoff and flooding dangers, elevation, slopes, and the allocation of land for development (Longley et al., 2005). Improving the attractiveness of the land is a simple approach to increase the value of the property. Properties with good topographic features (soil, water, temperature) are more likely to attract purchasers, and they will be ready to pay a premium price for it as well. A dwelling that has not been good topographic features will command a significantly lesser price (Moudon and Hubner, 2000).

H4: Topographic characteristics is significantly affected to residential land value

METHODOLOGY

Population and Sample

The population of this study consists of two types, such as the residents in the Moratuwa Municipal Council Area and the professionals who are working closely with land values, such as valuers and managers in the financial institutes. The purposive sampling method was used as the

sampling technique and forty (40) numbers of residents and four (04) professionals, including three valuers and a bank manager, were selected.

Data Collection Method

Primary and secondary data collection methods were used in this study. An online structured questionnaire was used to collect data from residents, including the demographic features and factors determining the land value. Five-point Likert scale questions were developed to collect data on the latter part. Interviews were conducted to collect data from the professionals and were recorded. Data related to geography and the environment was dependent on the secondary data sources, such as the Annual Report of the Moratuwa MC and the reports and development plans of the Urban Development Authority. The residential land values were collected from the Moratuwa MC reports as an average value was calculated according to the respondents' living geographical location.

Data Analysis Method

The research applied both qualitative and quantitative data analysis methods. The data collected from the residents was analysed quantitatively using descriptive statistics, correlation and regression analysis, as well as the narrative data collected from the professionals was analysed using content analysis.

RESULTS AND DISCUSSIONS

Quantitative Analysis

Demographic analysis shows that the majority of the respondents from the residents' category were above 30 years of age, working in the private sector and were married. The characteristics of the professionals' reveals that they are above 45years and are having more than 10years experience in the professional field. Table 01 presents the extent of the land the respondents owned and the majority are in the range of 6-10 perches extent and only 7% represent the ownership of more than 40 perches of extent.

To perform the descriptive analysis, the level of agreement of the respondents to the statements in the questionnaire will be converted into numeric values by placing a weight for each agreement level as 1 for Strongly Disagree, 2 for Disagree, 3 for Neutral, 4 for Agree and 5 for Strongly Disagree.

Table 1: Extent of the Land of the Respondents

Category	Number	Percentage
Below 6 perches	10	25.0
6-10 perches	18	45.0
11-20 perches	4	10.0
21-40 perches	5	12.5
Above 40 perches	3	7.5
Total	40	100.0

Source: Survey Data (2021)

Descriptive Analysis

The highest number of acres of land is in the 6-10 perch category (45%). Below, six purchase categories represent 25% of the total, which cumulatively results in 70% of the total.

Table 2: Descriptive Statistics of the Perceptions on Factors Affecting Land Value

Factors	N	Mean	Std. Deviation	Var	Skew
Location	**40**	**3.938**	**.0733**	**.215**	**.374**
Close distance to Moratuwa town and other peripheral towns (Ratmalana, Piliyandala, Panadura) is a key factor of determining the residential values.	40	4.400	.6325	.400	-.563
"Higher availability and short distance to supermarkets and other daily convenience shops with home delivery services makes easier lifestyles.	40	3.675	.7299	.533	-.234
Accessibility of day-care facilities, primary and secondary schooling availabilities are high in the area.	40	4.050	.4501	.203	.240

"Establishments of State and private universities, vocational training Institutions and, other educational and training centers have thrived the residential values.	40	3.475	.8161	.666	-.214
Availability of special educational institutions (for differently able persons etc.) have created additional value to the area.	40	3.825	.9306	.866	-.638
Accessibility	**40**	**3.954**	**.0769**	**.236**	**.374**
Comprehensive road network with access to A Grade and B grade roads are easily available in the area.	40	3.700	.7232	.523	-.325
Availability of public transport stations are more convenient.	40	4.425	.6360	.404	-.649
Short distance to public & private sector commercial properties facilitates commercial activities.	40	3.475	.8161	.666	-.214
Short distance to banks and financial markets enhances economic feasibilities.	40	4.300	.6485	.421	-.380
Availability of quality and instant healthcare and medical facilities is high.	40	3.975	.7334	.538	-.371
Electricity, water, telephone, mobile network and WIFI facilities are up to the expected standards.	40	3.850	.8930	.797	-.602
Neighborhood Characteristic	**40**	**3.938**	**.0698**	**.195**	**.374**
Neighborhood street lighting and street conditions are enough to facilitate daily life.	40	4.500	.6794	.462	-1.033
The area is free from nuisance and pollution.	40	3.525	.8767	.769	-.561
Quality of view in the neighborhoods encourages living in the area.	40	3.800	.6485	.421	.214
Location of waterfront has created additional geographical value to the area.	40	3.600	.9001	.810	-.648
Drainage and Sewer Lines do not disturb general life of the residents.	40	3.775	.7334	.538	-.437
Social and personal security of the residents are ensured in the area.	40	4.425	.6360	.404	-.649

Zoning Characteristics	40	3.929	.0668	.178	.374
Present availability of residential lands is considerably lower hence, results a higher demand.	40	3.875	.8530	.728	-.273
More lands in the area are currently used for commercial purposes than residential purposes.	40	4.175	.7121	.507	-.269
Lands are easily convertible for either residential or commercial purposes.	40	3.425	.6360	.404	-.649
Elevation from road level do not adversely affect environmental protection of the civilians.	40	4.225	.6197	.384	-.177
Green space/ green cover of the area can be satisfied with.	40	3.975	.7334	.538	-.371
Regulatory impact to the use of lands is comparatively higher.	40	3.850	.8930	.797	-.602
Topography Characteristics	40	4.100	.0669	.179	.374
Slope of the lands are favorable for any type of use as appropriate in the area.	40	4.450	.5064	.256	.000
Soil type & conditions are fairly good enough to cater both industrial and residential requirements of the civilians.	40	3.500	.8165	.667	-.298
Load bearing qualities of the soil is higher.	40	4.325	.6558	.430	-.452
The area has no history of severe floods, landslides, and other disasters.	40	4.075	.6155	.379	-.039

Source: Survey Data (2021)

As per the descriptive analysis on research elements, the statement "neighbourhood street lighting and street conditions are fair enough to facilitate daily life" has the highest mean value (4.500), emphasizing the higher agreement of respondents towards it. On the other hand, "Lands are easily convertible for either residential or commercial purposes" is the statement with the lowest mean value (3.425), emphasizing the relatively low agreement of the respondents towards this statement compared to the other statements. However, according to the mean values, all statements

have a mean greater than 3 and it implies the agreement of respondents on the given statements in the questionnaire.

Correlation Analysis

The correlation coefficient between location and the residential land value is +0.925 (r > 0.7) emphasizing the strong positive linear relationship between the two variables. Hence, this confirms the same observation of in the regression analysis. H_0 is rejected and H_1 is accepted.

Table 3: Correlation between Location and Residential Land Value

		Location	Residential Land Value
Location	Pearson Correlation	1	.925**
	Sig. (2-tailed)		.000
	N	40	40
Residential Land Value	Pearson Correlation	.925**	1
	Sig. (2-tailed)	.000	
	N	40	40
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Survey Data, (2021)

The correlation coefficient between accessibility and the residential land value is +0.790 (r > 0.7) emphasizing the strong positive linear relationship between the two variables. Hence, this confirms the same observation of in the regression analysis. H_0 is rejected and H_2 is accepted.

Table 4: Correlation between Accessibility and Residential Land Value

		Accessibility	Residential Land Value
Accessibility	Pearson Correlation	1	.790**
	Sig. (2-tailed)		.000
	N	40	40
Residential Land Value	Pearson Correlation	.790**	1
	Sig. (2-tailed)	.000	
	N	40	40
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Survey Data, (2021)

The correlation coefficient between zoning characteristics and the residential land value is +0.256 (r < 0.7) emphasizing the weak positive

linear relationship between the two variables. Hence, this confirms the same observation of in the regression analysis. H_0 is accepted and H_3 is rejected.

Table 5: Correlation between Zoning Characteristics and Residential Land Value

		Zoning Characteristics	Residential Land Value
Zoning Characteristics	Pearson Correlation	1	.256
	Sig. (2-tailed)		.000
	N	40	40
Residential Land Value	Pearson Correlation	.256	1
	Sig. (2-tailed)	.000	
	N	40	40

Source: Survey Data, (2021)

The correlation coefficient between topography characteristics and the residential land value is +0.524 (r < 0.7) emphasizing the moderate positive linear relationship between the two variables. Hence, this confirms the same observation of in the regression analysis. H_0 is accepted and H_4 is rejected.

Table 6: Correlation between Topography Characteristics and Residential Land Value

		Topography Characteristics	Residential Land Value
Topography Characteristics	Pearson Correlation	1	.524[**]
	Sig. (2-tailed)		.000
	N	40	40
Residential Land Value	Pearson Correlation	.524[**]	1
	Sig. (2-tailed)	.000	
	N	40	40

Source: Survey Data (2021)

Regression Analysis

Regression Analysis is the statistical technique used to build up a model to present the relationship between a dependent variable and independent variable/s. In this study, multiple regression analysis has to be performed to identify the relationship between the dependent variable and independent variables since the study involves more than a single independent variable.

Table 7: Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	-.099	.068		-1.442	.158
	Location	.528	.082	.519	6.449	.000
	Accessibility	.263	.087	.272	3.030	.005
	Neighbourhood Characteristics	.185	.074	.173	2.484	.018
	Zoning Characteristics	.010	.068	-.009	.145	.886
	Topography Characteristics	.058	.033	.052	1.724	.094
a. Dependent Variable: Residential Land Value						

Source: Survey Data (2021)

The results of multiple regression analysis performed using IBM SPSS package are presented in Table 7, all the independent variables got positive coefficients implying that all the independent variables make a positive impact towards the dependent variable. In ascending order, independent variables have high coefficients in the order of Location, Accessibility, Neighbourhood Characteristics, and Topography Characteristics respectively. According to the sig. (p-value), the Location, Neighbourhood Characteristics, Accessibility and Topography Characteristics have significant positive impact on the Residential Land Value (p-value < 0.05) while Zoning Characteristics do not show significant impact.

Qualitative Analysis

The focus of the qualitative analysis mainly lies in analysing the qualitative data collected in respect to the determinants of residential land values in the Moratuwa MC area. Further, the study attempts to understand and evaluate the extent to which the findings of the qualitative study coincide with those of the quantitative analysis. Individual interviews were conducted with the professionals and as the data is narrative, content analysis was used to analysis.

According to the results in Table 8, the main factors highlighted by the respondents that affect the residential land value of the area are location, accessibility and neighbourhood characteristics. Most of the respondents were of the view that aspects pertaining to the location have significantly

improved the values of the residential lands over the years. They pointed out that lands closer to the Galle Road are always at the highest values and the developments regularly taking place have resulted in increasing such values. They found no evidence on the impact of zoning characteristics.

Table 8: Content Analysis

	Res # 1	**Res # 2**	**Res # 3**	**Res # 4**
Location	✓	✓	✓	✓
Accessibility	✓	✓	✓	✓
Neighbourhood Characteristics	✓	✓	✓	✓
Zoning Characteristics	-	-	-	
Topography Characteristics	✓	✓	-	-

Source: Survey Data, (2021)

CONCLUSION

The focus of the study is to examine the factors that influence residential land values in the Moratuwa Municipal Council Area, as one of the sub-urban areas of City of Colombo. The land values of a region are affected by numerous types of variables which in turn is affected by several sub-factors. As a result, a thorough investigation has yielded a plausible judgment on the aspects that genuinely define the worth of a certain location. The study focused on the Moratuwa area for a number of reasons, including the development perspective of the area, the state-controlled entries and the private property ownership perspectives, which can be concluded to widely vary from the same of the combined other areas, including Ratmalana, Mount-Lavinia etc. The results of the study revealed that both analysis shows related results. The views collected from the residents were almost equal to the results of the professionals. According to the quantitative analysis the factors like location, accessibility neighbourhood characteristics and topography characteristics were significantly influenced on the land values. Similarly, the result of the qualitative analysis also shows that the location, accessibility and the neighbourhood characteristics were significant on land values. Hence, it recommended to pay more attention on the significant factors in all types of transaction related to residential land values and respective parties should encouraged on promoting those significant factors.

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