

FACTORS INFLUENCING THE LAND VALUES ALONG PYAY ROAD AND KABARAYE PAGODA ROAD IN YANGON CITY*

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Abstract

Yangon City is the commercial hub and currently inhabited by 10 percent of the total population of Myanmar (YCDC, 2022). The population growth rate of Yangon has increased due to rising job opportunities, which in turn led to a greater demand for housing. Accordingly, the government has extended the area of the city by establishing new towns around the city. As such roads connecting these new towns and Downtown of Yangon, as well as with port and airport, become important. Among major roads, the two roads, Pyay Road and Kabaraye Pagoda Road, become important and the land value along these roads become obviously higher as compared with other roads. Against this background, this study aims to examine the influencing factors on land value along these two roads. The main interests of this study are; in which parts of these two roads are highest in land value and what are the reasons of such high land value along these two roads. Both interviews and questionnaire surveys were conducted for data collection and analyzed using Factor Analysis and Relative Important Index (RII) (Sridhar, 2022). The measure of sampling adequacy was also used to test the inter-correlations among the variables. The value of land along the study area is even higher than the average land value of Yangon City. The extremely higher land value inhibits further investment by the foreign enterprises and they move to other ASEAN countries as Vietnam, Thailand and Laos where the land value is relatively cheaper. In this way, the economy of the city can be encountered by the domino effect, the chain reaction of the events.

Keywords: land value, Yangon, new towns, investment, RII

Introduction

Yangon was established as a modern city with grid-pattern of road in 1853, and by 1874, it was officially designated as the **downtown area**. It had pass through many stages of urban expansion through out the long period. During the last few decades, especially after 1988, due to the changes of government policy, the area of Yangon had been dramatically increased by establishing many new towns and industrial zones around the City. Accordingly, the urban land use pattern of Yangon had also changed remarkably in response to the new policies. As a result, the transportation routes become important to commute from one place to another within the city area.

Since 1989, with the transformation of government policy from socialist economy to market-oriented economy, government encourage foreign investments to develop state's economy. At that time, as Yangon has better infrastructure then other places, foreign investment became to concentrate in Yangon and faced with lack of international standards office buildings. To fulfil this need, investors choose privately owned large land plots along Pyay Road and Kabaraye Pagoda Roads which have better accessibility to international airport as compared with other places to build international standards office buildings. Such situations led to the occurrence of mixed-use buildings along these two roads, where apartment rooms for residents,

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services activities, office rooms for business, and shopping centers as commercial complex are included. So, investment mainly by foreign companies concentrated along these two roads and it was the reason of higher land values as compared with other places. The emergence of mixed-use buildings had some impact on land value (Interview, 2023).

With the continued growth of city's population and necessity of systematic urban expansion, a comprehensive "Strategic Urban Plan of Grater Yangon Project" was introduced by Yangon City Development Committee (YCDC) in collaboration with Japan International Cooperation Agency (JICA) in 2013. This strategic plan redefined the previously designated downtown area as the **First Central Business District (First CBD)**, serving as a focal point for large-scale urban development and infrastructural transformation initiatives. High population concentration and traffic congestion problem of those Downtown 6 townships has been recognized as development control area for sustainable urban development of Yangon.

In 2022, zoning principles are laid down for Yangon City based on Strategic Urban Plan of Grater Yangon by YCDC and JICA, 2013. Besides, the government has been implementing special development projects of 'Second CBD', 'sub-CBD' and 'Development Promotion Area' at certain part on these two roads. That is why the land values along Pyay Road and Kabaraye Pagoda Road are higher than that of CBD area of Yangon City. Such information that where foreign investors have chosen to invest and urban development project sites has strong impact on today's Yangon land market (Interview, 2023).

According to Land Value Theory of Alonso (1960), land value is high in area close to CBD and low with the increasing distance from CBD. However, in Yangon City the land value has obviously higher in areas distant from the CBD and Sub-CBD, especially along Pyay Road and Kabaraye Pagoda Road.

Against this background, the interesting research questions are first of all, what are the influencing factors of land value along the Pyay Road and Kabaraye Pagoda Road in Yangon? Secondly, what are the impacts of such high land value in Yangon.

Aim

The main aim of this study is to examine the influencing factors of land value along Pyay Road and Kabaraye Pagoda Road.

Study Area

This research will focus on the land value along Pyay and Kabaraye Pagoda Roads and the increasing importance of road transportation due to the residential expansion of Yangon City. Pyay Road starts from Khayapin branch road of Mingalardon Township to the Thayattaw traffic light of Lanmadaw Township, having a length of 10.39 kilometre 6.493 miles (10.39 kilometre). Kabaraye Pagoda Road begins from 8 Mile junction of Mayangone Township to U Htaung Bo circle of Bahan Township and it is 10.2 kilometre (6.375 mile) long. The Study along Pyay Road and Kabaraye Pagoda Road faces serious challenges arising from variation of land values.

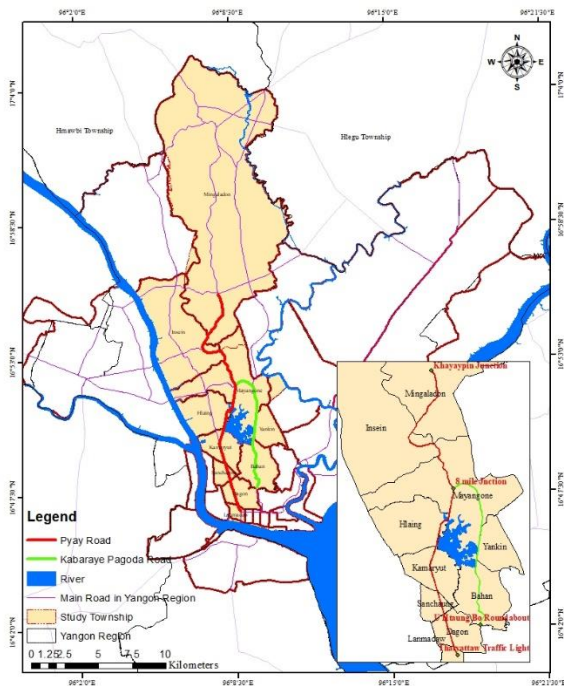


Figure 1. Location of Study Roads in Yangon City

Source: YCDC

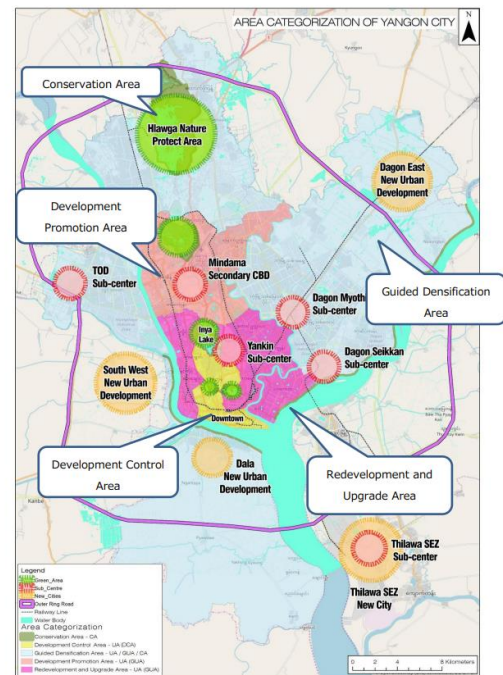


Figure 2. Area Categorization of Yangon City

Source: YCDC (Zoning Handbook, 2022, pg. 8)

Methodology

Due to necessity, both primary and secondary data are used to analyse. The primary data were collected by field observations, open talks, questionnaire survey and secondary data were collected from Yangon City Development Committee (YCDC) and Department of Urban and Housing Development (DUHD).

Many field observations had done on the two roads, Pyay and Kabaraye Pagoda Roads, observing the land use types along the whole road on both sides. The primary data are obtained through structured interviews with the authorities from two main government offices (YCDC and DUHD), real estate companies that have offices in the Yangon City area, and real estate brokers who have experienced in buying and selling of the land plots along the two main roads. Open talks were used with the local residents who have lived at least 5 years and above on these roads, with those who have purchased land plots on these roads for residing or for investment and also with those who have experience in purchasing the land in the recent past.

Applying Randomized Stratified Sampling method, questionnaires are distributed to those who are living near the mixed-use buildings, those who have purchased land on these two roads. There were 583 land plots along Pyay Road and 367 land plots along Kabaraye Pagoda Road. Questionnaires survey for local residents was conducted during November and December 2023, distributing 237 questionnaires for local residents in Pyay Road and 191 questionnaires in Kabaraye Pagoda Road. The necessary primary data are acquired through field surveys and questionnaires, based on the calculated sample size by using the formula, $n = N/1 + N/2$.

Finally, the collected responses were analyzed through the Factor Analysis and Relative Importance Index (RII). The RII method is extensively utilized in analyzing Likert scale research data to identify the crucial factor. To know the perception level of the resident, Likert scale or the 5-point scale is used as measurement instrument. The 5-point scale, as mentioned below, is simple and easy to give the relevant answer. The mean score and standard deviation of the variables 13 items were computed by SPSS based on the 5-point Likert scale test, where 1 represents “No impact,” and 5 represents “Very highly impact.” A higher score means that respondents were more satisfied. Based on these returned questionnaires influencing factors of land value along Pyay and Kabaraye Pagoda roads in Yangon City is analyzed.

Factor analysis (Pyay Road)

The impact level of residents is important factor for variation of land value. In order to know the perception of resident during real estate, 13 questions related to impact level are asked.

In the assessment of impact level, 5-point Likert scales, ranging from no impact to very high impact are employed, and based on responses to 13 variables. The variables include transportation, neighbourhood characteristic, government policy, environmental condition and location factor. These variables are suitable for the use of Factor Analysis.

Table 1 Factor extraction with an eigen values > 1 and total variance explained > 60.0%

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.244	24.950	24.950	3.244	24.950	24.950	2.241	17.236	17.236
2	1.508	11.600	36.550	1.508	11.600	36.550	1.951	15.008	32.243
3	1.237	9.514	46.065	1.237	9.514	46.065	1.500	11.540	43.784
4	1.068	8.214	54.279	1.068	8.214	54.279	1.298	9.986	53.770
5	1.015	7.807	62.086	1.015	7.807	62.086	1.081	8.316	62.086
6	0.969	7.456	69.542						
7	0.816	6.280	75.822						
8	0.752	5.782	81.604						
9	0.632	4.861	86.465						
10	0.543	4.178	90.643						
11	0.487	3.749	94.392						
12	0.393	3.025	97.418						
13	0.336	2.582	100.000						
Extraction Method: Principal Component Analysis.									

Source: Calculation from Sample Survey data

Principle components factor analysis was used because the primary purpose was to identify and compute the factors underlying the impact levels of residents, real estate agents and buyers. The initial eigenvalues showed that the first factor explained 24% of the variances, the second factor 11%, and the third factor 9 %. The fourth and fifth factor are 8% and 7% of the variance, respectively. The data shown in the Table 1 represent the extraction of factors with eigenvalues greater than 1, which represented 62.086% of the variance. Over 60 percent of total variances are sufficient criterion for the extraction factors for impact.

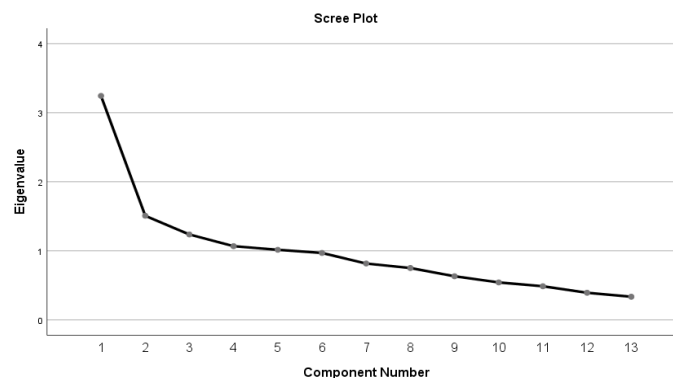


Figure 3. Scree Plot of 13 items of respondent' impact levels of resident's perception on the land value along Pyay Road

Source: Based on Table 1 (variance %)

In presenting scree plot, there were 5 factors with an eigenvalue of more than 1 are extracted for the assessment of cut-off point of factors as shown in Figure (Scree Plot). The purpose of the scree test is to identify the optimum number of factors that can be extracted before the amount of unique variance begins to dominate the common variance structure's (Hair et al., 2006, p.120)

Table 2. Kaiser-Meyer-Olkin Measure of Sampling Adequacy KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.701
Bartlett's Test of Sphericity	Approx. Chi-Square	529.179
	df	78
	Sig.	0

Source: Calculation based on sample survey data

Kaiser- Meyer- Olkin (KMO) method is used to determine whether factor analysis is appropriate. If the calculated result is more than 0.5 it is suitable to use the analysis (Hair et al., 2006). The KMO measure of sampling adequacy was 0.701 and Bartlett's test of sphericity is ($\chi^2 = 529.179$). The overall significance of the correlation matrix was 0.000. Thus, the data are suitable for factorization as shown in Table 3.

Table 3. Component Matrix for 13 items of Impact level of resident (N= 237)

Component Matrix^a					
	Component				
	1	2	3	4	5
Distance to Mixed use	0.726	-0.191	-0.054	0.059	0.080
Urban Planning Project	0.705	-0.168	0.026	-0.422	-0.022
Distance to Work Place	0.590	0.302	-0.340	-0.003	0.353
Distance to Educational Institution	0.639	0.374	-0.045	0.107	-0.081
Relative	0.560	-0.114	0.172	-0.128	0.138
Overpass	0.611	-0.163	0.273	-0.442	0.005
Distance to Commercial	0.564	0.271	0.110	0.477	-0.048
Distance to Downtown	-0.305	0.566	0.373	-0.083	0.230
Distance to Air Port	0.346	0.494	-0.490	0.007	-0.016
Distance to Government Office	0.265	0.098	0.766	0.229	0.172
Distance to Recreational Space	0.350	-0.445	-0.022	0.591	-0.199
Land size and shape	-0.232	0.114	-0.039	0.141	0.617
Land Characteristic	-0.016	-0.561	-0.175	0.083	0.594
Extraction Method: Principal Component Analysis.					

Source: Calculation based on sample survey data

a. 5 components extracted.

The five components result in 62.086% of the cumulative percentage of variance, indicating that they capture the majority of the variability in the dataset. It means that more than 50% of the variance in this model can be explained by these five generated components. Table (3) shows the results of varimax factor rotation. The highlighted variables were significantly loaded onto each factor (with loadings above 0.494), giving a high degree of association between the variables and their respective factors. Factor loadings are the means of interpreting the role each variable plays in defining each factor (Hair et al., 2006). They further recommend that loadings in the range ± 0.30 to ± 0.40 are minimally acceptable and loadings greater than ± 0.50 are generally considered necessary for practical significance.

The five factors are as follows: neighbourhood factors (Factor 1), transportation factors (Factor 2), government factors (Factor 3), environmental factor (Factor 4), and locational factors (Land factors) (Factor 5). These factors explained 62.086 % of the total variance. Neighbourhood Factors (Factor 1) were related to site's attraction due to neighboring facts. This factor accounted for 24.95% variance out of a total variance of 62.086 %, with significant factor loadings greater than (0.560) across seven variables: distance to Mixed-use areas (0.726), presence of urban planning project (0.705), distance to workplaces (0.590), distance to educational institution (0.639), relative's proximity (0.560), Overpass (0.611), and distance to commercial (0.564). Transportation Factors (Factor 2) were associated to site's attraction due to accessible facts. transportation. This factor dealt with the two factors, including distance to downtown area (0.566) and distance to airport (0.494). This factor explained 11.6% of variance with significant

factor loadings greater than (0.494). Government factor (Factor 3) contained one item, including distance to government office (0.766). This factor explained 4.17% of the variance. Environment Factor (Factor 4) included one item. This is distance to recreational space (0.591). This factor explained 8.214% of variance. Location Factors (Factor 5) were related to site's attraction due to the land use type. This factor accounted for 7.807% variance. This factor consisted two items, including land size and shape (0.617) and land characteristics (0.594).

Relative Importance Index for Pyay and Kabaraye Pagoda Roads

The thirteen different factors were identified through a detailed literature review and interviews with real estate agents. Of the results derived from Factor Analysis, to identify the most dominant that affects the land value along the two main roads, RII method is applied and these factors were categories into 5 major categories (1) Neighbourhood Factors (2) Government Factors (3) Transportation Factors (4) Environmental factors (5) Location factors. The five points Likert scale was framed to capture the perspective of local resident respondents, with the following options: no impact, little impact, moderate impact, high impact, and very high impact.

Initially a covering letter was followed by 5 sections corresponding to 5 major categories and the last section gathered demographic details of the respondents such as age, gender, experience in the field, number of transactions taken part and the type of stake holder. The RII is used to determine the relative importance among the factors using the formula.

$$\text{Relative Importance Index (RII)} = \frac{(1 \times r_1) + (2 \times r_2) + (3 \times r_3) + (4 \times r_4) + (5 \times r_5)}{(5 \times (r_1 + r_2 + r_3 + r_4 + r_5))}$$

Where, r1 is the number of the respondents who have given no impact ratings for a factor. r2 is the number of the respondents who have given little impact, for a factor r3 is the number of respondents who have given moderate impact, for a factor r4 is the number of respondents who have given high impact and for a factor r5 is the number of respondents who have given very high impact ratings for a factor.

Then, the RII is determined for each factor using the given formula. Thus, to highlight the reliability, impact level of a residents, investors and real estate agents on the land value along Pyay and Kabaraye Pagoda roads. The 13 different factors were categorized into 5 major categories were identified through a detail literature review and interviews with respondents.

Table 4. Total respondents' results of Land Value (N-237)

Category	Factor Considered	Respondents rating				
		R1	R2	R3	R4	R5
Neighbourhood Factor	Distance to Mixed use	8	7	25	58	139
Neighbourhood Factor	Distance to Urban Planning Project	9	14	26	53	135
Neighbourhood Factor	Distance to Work Place	6	16	49	126	40
Neighbourhood Factor	Distance to Educational Institution	5	59	78	57	38
Environmental Factor	Distance to Recreational Space	7	47	68	59	56
Neighbourhood Factor	Distance to Commercial	25	39	35	49	89
Neighbourhood Factor	Overpass	13	48	78	67	31

Category	Factor Considered	Respondents rating				
		R1	R2	R3	R4	R5
Location Factor	Land size and shape	11	73	76	45	32
Transportation	Distance to Downtown	17	53	87	56	14
Neighbourhood Factor	Distance to Government Office	49	64	68	39	17
Location Factor	Land Characteristics	24	79	68	48	18
Transportation Factor	Distance to Air Port	35	87	59	36	20
Neighbourhood Factor	Relative	51	41	48	58	39

Source: Field Observation

Table 9. Total Respondents Results of Land Value factor (N – 191)

Category	Factor Considered	Respondents rating				
		R1	R2	R3	R4	R5
Neighbourhood Factor	Distance to Mixed use	1	6	32	59	93
Neighbourhood Factor	Urban Planning Project	5	3	26	68	89
Neighbourhood Factor	Distance to Educational Institution	20	33	31	38	69
Environmental Factor	Distance to Recreational Space	6	41	53	50	41
Neighbourhood Factor	Distance to Work Place	3	11	45	108	24
Neighbourhood Factor	Overpass	12	44	65	50	20
Location Factor	Land size and shape	5	63	53	42	28
Neighbourhood Factor	Distance to commercial	5	44	66	46	30
Transportation	Distance to Downtown	13	43	79	42	14
Government Factor	Distance to Government Office	34	38	45	45	29
Location Factor	Orientation of Land	21	62	42	30	20
Neighbourhood Factor	Relative	46	56	53	23	13
Transportation Factor	Distance to Air Port	30	62	44	35	20

Source: Field Observation (2023)

Table 5. RII of the factors affecting land value Pyay and Kabaraye Pagoda roads

Rank	Category	Factor Considered	RII % (Pyay Road)	RII % (Kabaraye Pagoda Road)
1	Neighbourhood Factor	Distance to Mixed use	0.86	0.85
2	Neighbourhood Factor	Urban Planning Project	0.84	0.84
3	Neighbourhood Factor	Distance to Work Place	0.74	0.70
4	Neighbourhood Factor	Distance to commercial	0.71	0.68
5	Neighbourhood Factor	Overpass	0.69	0.65

Rank	Category	Factor Considered	RII % (Pyay Road)	RII % (Kabaraye Pagoda Road)
6	Neighbourhood Factor	Distance to Educational Institution	0.65	0.62
7	Environmental Factor	Distance to Recreational Space	0.64	0.74
8	Location Factor	Land size and shape	0.61	0.63
9	Neighbourhood Factor	Relative	0.60	0.59
10	Transportation Factor	Distance to Downtown	0.59	0.60
11	Location Factor	Land Characteristics	0.56	0.56
12	Transportation Factor	Distance to Air Port	0.53	0.49
13	Government Factor	Distance to Government Office	0.52	0.55

Source: Calculation based on sample survey data

The presence of one factor from neighbourhood categories and two factors show government that these are two important categories influencing the land value. The ranking of factors under each category is represented in table 5. In the neighbourhood category, distance to mixed use (RII = 0.86) and Urban Planning Project (0.84) are the important factors influencing the land value along the Pyay Road. The study results illustrate that the distance to the mixed use and urban planning project are the influence factor of the essential criterion of the value of land along the Pyay Road. The land value gradually decreases as the distance from the mixed use. These findings are the notable observations of the study, which point out the impact of the surrounding development on the land value.

The relative importance index ranking method was followed to determine the relative importance of the factors. The resident perception was captured through a questionnaire survey, and the RII ranking method was applied to the collected responses. The most significant factors affecting the land value along the Pyay Road were determined to be the neighbourhood and government categories related factors. Within the two categories, the most important factors are distance to mixed use (RII = 0.86), urban planning project (RII = 0.84). The property investors should consider the extent of urban development of the surroundings and the future development prospectus while making investments. The research findings can help researchers and professionals in the domains of real estate investments, urban planning, local urban bodies, property evaluators, in their respective decision-making. The identified important factors can be utilized further in modelling of land prices.

The ranking of factors under each category is represented in table. In the neighbourhood category, distance to mixed use (RII = 0.85) and urban planning project (RII=0.84) is the influencing factor of land value along Kabaraye Pagoda Road. In the transportation category, distance from downtown (RII = 0.59), distance to airport (RII = 0.53) are the critical factors. The study results illustrate that the distance to the mixed use and urban planning project are the influence factor of the essential criterion of the value of land along the Kabaraye Pagoda Road.

These findings are notable observations of the study, which point out the impact of the surrounding development on the land value. The study determined the factors affecting the land value along the Kabaraye Pagoda Road. The relative importance index ranking method was followed to determine the relative importance of the factors. The resident perception was captured through a questionnaire survey, and the RII ranking method was applied to the collected responses.

The most significant factors affecting the land value along the Kabaraye Pagoda Road were determined to be the neighbourhood and government categories related factors. Within the two categories, the most important factors are distance to mixed use (RII = 0.85), urban planning project (RII = 0.84). The property investors should consider the extent of urban development of the surroundings and the future development prospectus while making investments. The research findings can help researchers and professionals in the domains of real estate investments, urban planning, local urban bodies, property evaluators, and banks in their respective decision-making. The identified important factors can be utilized further in modelling of land prices.

Factor analysis (Kabaraye Pagoda Road)

The impact level of residents is important for variation of land value. In order to know the perception of resident during real estate (13) questions related to Impact level are asked.

In the assessment of impact level, 5-point Likert scales, ranging from no impact to very high impact are employed, and based on responses to 13 variables. The variables include transportation, neighbourhood characteristic, government policy, environmental condition and location factor. These variables are suitable for the use of Factor Analysis.

Table 6. Factor extraction with an eigen values > 1 and total variance explained > 60.0%

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.259	25.068	25.068	3.259	25.068	25.068	2.372	18.246	18.246
2	1.505	11.578	36.646	1.505	11.578	36.646	2.013	15.486	33.732
3	1.285	9.883	46.529	1.285	9.883	46.529	1.321	10.163	43.895
4	1.174	9.031	55.561	1.174	9.031	55.561	1.298	9.984	53.879
5	1.012	7.786	63.347	1.012	7.786	63.347	1.231	9.468	63.347
6	0.822	6.324	69.671						
7	0.793	6.097	75.768						
8	0.722	5.556	81.324						
9	0.694	5.335	86.659						
10	0.556	4.277	90.936						
11	0.438	3.366	94.302						
12	0.397	3.051	97.353						
13	0.344	2.647	100.00						

Extraction Method: Principal Component Analysis.

Source: Calculation from Sample Survey data

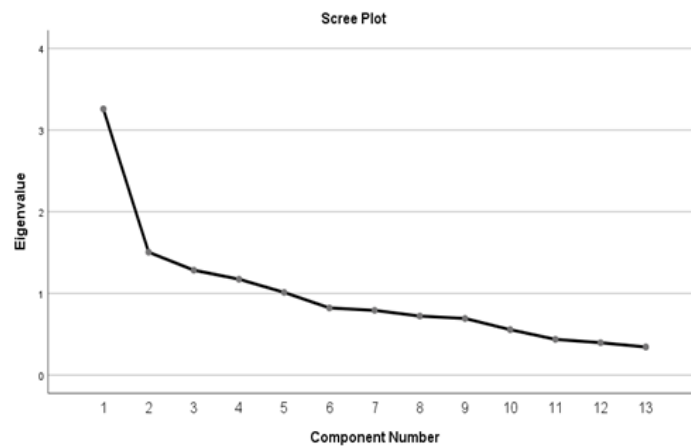


Figure 4 Scree Plot of 13 items of resident's impact on the land value along Kabaraye Pagoda Road

Source: Based on Table 5 (variance %)

Principle components factor analysis was used because the primary purpose was to identify and compute for the factors underlying the impact level of resident, real estate, byers. The initial eigenvalues showed that the first factor explained 25% of the variances, the second factor 11% of the variances and the third factor 9% of the variances. The fourth and fifth factor are 9% and 7% of the variance. The data shown in the table 5 are the extraction of factors from eigenvalues greater than 1 which represented 63.347%. Over 60 percent of total variances are sufficient criterion for the extraction factors for impact.

In presenting scree plot, there were 5 factors with an eigenvalue of more than 1 are extracted for the assessment of cut-off point of factors as shown in Figure (4). The role of the scree test is to identify the optimum number of factors that can be extracted before the amount of unique variance begins to dominate the common variance structure's Hair et al. (2006, p 120)

Table 7. Kaiser-Meyer-Olkin Measure of Sampling Adequacy KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.744
Bartlett's Test of Sphericity	Approx. Chi-Square	448.938
	df	78
	Sig.	0.000

Source: Calculation based on sample survey data

Kaiser-Meyer-Olkin (KMO) method is needed to determine whether to use factor analysis or not. If the calculated result is more than 0.5, it is suitable to use (Hair et al, 2006). The KMO measure of sampling adequacy is 0.744 and Bartlett's test of sphericity is ($\chi^2 = 448.938$).

The five components result in 63.347 % of cumulative percentage of variance. It means that more than 50% of the variance in this model can be explained by these five generated components. They further recommend that loadings in the range ± 0.30 to ± 0.40 are minimally acceptable and loadings greater than ± 0.50 are generally considered necessary for practical

significance. Tebachonick and Fidell (1996) suggested that only variables with loadings of .032 and above can be interpreted, otherwise the choice of the cut-off size of loadings depends on the researcher's preference. Five factors are relatively large numbers of factors to be retained, and the eigenvalues were more than 1.0 for five factor (1.012). The following results of descriptive analysis are to fulfill this study purpose and to evaluate land value along Kabaraye Pagoda Road. The local resident impact level for transportation, investment required and economic condition are presented evaluate the impact level of land value along Kabaraye Pagoda Road. Factors such as transportation, investment required and economic condition are the main factors that determine the choice of living along the road.

The five factors were labelled based on the consideration of resident's perceptions of sites' attributes as follows. These five factors included: resident's perceptions of sites' attributes resident's desires of sites' attributes (Places or sites) These factors explained 63.347% of total variance.

Table 8. Component Matrix for 13 items of Impact Level of Stakeholder (N= 191)

Component Matrix ^a					
	Component				
	1	2	3	4	5
Distance to Mixed-use	0.709	-0.368	0.181	-0.032	0.039
Urban Planning Project	0.703	-0.188	-0.020	-0.104	0.084
Distance to Work Place	0.603	-0.301	0.385	-0.095	-0.121
Distance to Educational Institution	0.663	0.307	-0.079	0.048	-0.007
Relative	0.626	0.336	-0.195	-0.203	0.127
Overpass	0.562	-0.138	0.174	0.404	0.005
Distance to Commercial	0.541	0.183	-0.411	0.156	0.140
Distance to Downtown	-0.270	0.555	0.226	0.373	-0.077
Distance to Air Port	0.397	0.510	-0.042	-0.236	0.171
Land size and shape	-0.119	-0.102	0.579	-0.150	0.379
Land Characteristics	0.239	0.454	0.535	0.302	-0.138
Distance to Government Office	-0.036	-0.258	-0.196	0.650	0.455
Distance to Recreational Space	-0.234	0.186	0.159	-0.275	0.675
Extraction Method: Principal Component Analysis.					

a. 5 components extracted.

Source: Calculation based on sample survey data

Component 1 was related to sites' attraction of land value. This factor accounted for 25.068% variance out of a total variance of 63.347%, with factor loadings greater than (0.553) neighbourhood factor on seven variables: Distance to mixed use (0.709), Urban Planning Project (0.703), distance to work place (0.603), distance to educational institution (0.663), relative (0.626), distance to government office (0.562), distance to commercial (0.541).

Component 2 was associated to attraction sites' attributes of transportation factor. This factor dealt with the one factor item, including distance to downtown (0.555) and distance to airport (0.510). This factor explained 11.578% of variance. Component 3 contained two items, including land size and shape (0.579), land characteristics (0.535). This factor explained 9.883% of the variance.

Component 4 included one item. This is distance government office (0.650). This factor explained 9.031 % of variance.

Component 5 was associated with the appreciation of natural resources. This factor consisted of one item that related to land value with 7.786% of variation explained. The label was assigned from one variable with significant factor loadings greater than 0.701 including distance to recreational space (0.675). (Table 8)

Findings and Discussions

According to the Strategic Urban Development Plan of the Grater Yangon, currently, Yangon City is inhabited by 10 percent of the country population or 30 percent of the total urban population in Myanmar. The population growth rate is two times higher than the national average and it has been developing as a Mega City (YCDC and JICA, 2013). With the increasing number of populations, more land is necessary for residents. As such the city area has been extended by restabbling new township along the outer rim of the city.

Being the commercial hub of the country, domestic and foreign entrepreneur interested to invest in Yangon City. They need land to construct international standard office buildings, and that was fulfilled by building along Pyay and Kabaraye Pagoda roads. On the other hand, for sustainable development of Yangon, zoning project of the city has laid down and implantation has been carried out since 2013 by YCDC. According to these projects, the construction of new buildings is restricted as development control area. From 8th Mile junction to Mindhamma junction, which include in the study area are likely to develop more in near future and Bahan, Yankin and Mayangone townships are planned to be upgraded as development promotion area (YCDC, 2022). As such, domestic and foreign entrepreneur mainly interested in these areas for investment. Purchasing of land by real estate agents in this project area increase the land value of this area. However, the land value of the areas that has skyline limit due to Shwedagon Pagoda and height limit of Mingladon Airport has been increasing with lower rate as compared the land along these two roads. It is obvious that the abnormal increased of land value in the study area is more concerned with the government policy. Many field observations and secondary data had proved it.

According to Factor Analysis and RII method, the geographic setting of these two roads has strong effect on accessibility to Mingaladon Airport, lowering of transport cost and time due to construction of overpasses which in turn affect the land value.

The influencing factors on the rise and fall of land value along Pyay Road and Kabaraye Pagoda Road are studied, based on 5 categories and 13 variables. Perception levels of the residents are analyzed by Likert scale with 13 variables. In order to reduce the variable included into the response, Factor Analysis is used which control 5 dominant components, neighbourhood,

transportation, government policy, environmental and location factors. According to the results, resident's reliability on neighbourhood factor along the study roads are high. Besides, 13 variables derived from Factor Analysis are studied by RII method. Perceptions of the residents are based on the responses to the questionnaires.

According to the results, the most dominant influencing factor of the rise and the fall of land value is the distance from the mixed-use buildings and the second is the distance from urban planning project. The rise in the land value is closely related to the nearness to mixed use buildings and development project areas, which land value is higher ranging between 300,000 and 500,000 kyats per square foot as compared to land values in other areas along these two roads (Interview, Dec 2023). The distance from the mixed-use buildings is also related to the neighbourhood characteristics and government policy on the permission of the construction of such buildings. In their case, government policy is the most dominant factor. The Second CBD and Sub CBD are being implemented by the initiative of the government along the two main roads. In this case the spatial variation of land value along Pyay Road and Kabaraye Pagoda Road is more concerned with the government planning project.

Conclusion

A key stakeholder interview mentioned that, *“As more people purchase land plots the value of land in Yangon City has been increasing. The value of land plot along the study area is even higher than the average land value of Yangon City. The extremely higher land value inhibits further investment by the foreign enterprises and they move to such Asean countries as Vietnam, Thailand and Laos where the land value is relatively cheaper”* (Interview, Dec 2023).

In order to prevent from such move, Internal Revenue Department has fixed the value of land per square foot since 2013. However, the sellers and buyers of the land ignore the set rate. It is learnt that some land plot buyers could not repay the loan from the bank because of being unable to sell out the plots they have purchased due to extremely high price of land.

Another interview mentioned as, *“The cost of construction of housing has risen notably and thus they cannot sell at reasonable value”* (Interview, Dec 2023). As a result, they have to stop further construction work and the construction workers lose their job, increasing amount of unused labour. As a result, Pyay Road and Kabaraye Pagoda Road have become more important for the construction of mixed-use buildings by the foreign investors. The areas along these two roads also have large open plots of land for construction of large mixed-use buildings. After the emergence of mixed-use buildings, over passes were constructed and traffic light system was upgraded by the government to reduce traffic congestion for the smooth flow of people and commodities. In the past, only the road section between Hledan junction and Parami Junction have traffic light system, but no light system for turning to the right or left side. After the emergence of Lottle Hotel, Kantharyar Hospital, Market Palace and Shwehinthar Condominium Building along the road section traffic light system was upgraded Intelligent Traffic System (ITS) and Traffic Impact techniques, enhancing smooth transportation. Thus, the value of land near the mixed-use buildings has increased by 500,000 kyats to 800,000 kyats per square foot (Interview, Dec 2023).

Within the study area there are altogether 21 mixed-use buildings, 15 on Pyay Road and 6 on Kabaraye Pagoda Road. Apart from these buildings other mixed-use buildings also emerged along these roads according field survey. Based on current land value, neighbourhood characteristics are also important in affecting the land value. The change of land value in Yangon City is mostly related to the government policy and urban development project implementation. Second CBD establishment project included in Grater Yangon Strategic Plan and Development Promotion project included is smart city plan affected the land value along Pyay Road and Kabaraye Pagoda Road and the land value has risen up to from 300,000 kyats to 500,000 kyats per square foot. According to Greater Yangon strategic Plan, Land areas are classed into different types based on development level. 8th mile junction is included in the Development Promotion Area while the road section in Yankin Township along Kabaraye Pagoda Road is included in the sub-CBD area. Most real estate agents know these projects and they purchased land plots adjoined with the road section and control the value of the land, increasing the land value.

Likewise, the rapid increase of the population in Yangon City needs more housing. In order to satisfy the need. The government of Myanmar established new towns in the suburban areas and some companies constructed new residential buildings in these areas. However, very few people purchased the apartments of the housing and thus the companies have to face with financial problem, decreasing amount of investment in housing project which can lead to the increasing number of unemployment. Without buyers of the apartments, the construction companies cannot stand for long and may also encounter with losses. In such situation, the companies may not be able to pay the money borrowed from the bank which can lead to the collapse of the banks concerned. In this way, the economy of the city can be encountered by the domino effect, the chain reaction of the events. As one may achieve a comprehensive understanding of the influencing factors along the two main road of Yangon, further research, particularly on real estate and urban economy should be conducted.

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