A Study on Environmental Factors' Influence Towards the Potential Buyers' Decision on Luxury Apartments in the City of Colombo and Suburbs

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Abstract

Luxury vertical living in urban and suburban localities has become increasingly popular in Sri Lanka over the past few years. The residential sector is the most visible of real estate asset class in Colombo and known to be the closest to personal desires of urban community. The main objective of this study is to identify the environmental attributes which significantly influence the customer's purchase decision of luxury apartments with reference to the Colombo city and suburbs. Through a comprehensive literature review, a conceptual framework was developed in which 13 attributes identified associated with environmental characteristic and external conditions of the apartments. The questionnaire survey was carried out for a convenience sample of 150 respondents. Principal component analysis was conducted to identify the significance of each attribute that influence on the criteria of buyers' decision. Out of the 13 attributes, Open Spaces, Water bodies, Nice Neighborhood, Prestige Neighborhood & Safety Neighborhood are identified as the most important, Air quality, noise

from Traffic & Industrial Noise are identified as important, Ventilation & Abundant Natural Light are identified as the moderately important and the remaining Waste Water Treatment, Rain Water Harvesting & Solar Energy are identified as the less important. The study provides insights for the investors in real estate market, but for planning professionals to understand the locational factors that influence on purchase decision of a buyer.

Keywords: Luxury Apartments; Environmental Factors; Prospective Buyers' Decisions; Colombo

1. Introduction

Cities have grown and societies have become more complex as a result of the urbanization. Therefore, the living spaces from suburbs to urban areas have changed, especially with respect to limited availability of land spaces. Vertical living has become increasingly popular in Sri Lanka over the past few years. Luxury vertical living is becoming especially renowned, and the vast number of luxury apartment buildings in Colombo continued to transform the city. In 2009 the luxury housing stock stood at 783 units and by 2015 the number has gone up to 2,657 units. The skyline of Sri Lanka's capital is growing in terms of the number of luxury apartment units with the market expected to reach 6,000 units by 2018-19, from 2,657 units at the moment (Ratnasingham, 2015). As the country's infrastructure improves to accommodate new inhabitants, Colombo is becoming increasingly popular for luxury property development.

Buying an apartment is one of the most significant economic decisions that people make, and it requires gathering a lot of information regarding its features (Kiefer, 2007). People tend to buy an apartment instead of buying a land and build a house. The property purchase is a complex decision-making process as evidenced by costly acquisition, infrequent purchase,

riskiness, high self-expressiveness, and awareness among buyers of significant differences among product alternatives. Buyers are very particular about the property attributes that they are contemplating, thus, giving rise to differences in attribute preferences among them (Cardella & Seiler, 2016). Therefore, this study attempts to identify the level of priority given to the internal and external environmental features by prospective buyers before making a purchase decision of an apartment. Environmental factors including surrounding area and safety neighborhood become the key factor of majority home buyers when making purchase decision. Iman & Tian (2013) has implicated that examining the influence of environmental factors needs to be in place in property development appraisal or valuation and environmental amenity should continue to exist to preserve sustainable property market. The quality of that environment largely affects the decisions made on the real estate market. This has been recently addressed by many developers when selecting a suitable location for development. Scenic value is an important determinant of real estate value, and it is the critical factor as regards the prices of recreational and residential property (Cellmer R., 2012). Further, scenic beauty not only plays a major role when purchasing an apartment but also during the marketing stage of the property. Emissions from road, air and rail transport are major causes of photochemical smog released in to the lower atmosphere (Akadiri P.O., 2012). Buildings are the main energy consumers and energy use is one of the most important environmental concerns and managing its use is unavoidable in any functional society. Many developers have incorporated energy efficiency and water management aspect in condominium properties due to the growing concern and awareness of environment pollution as well as mitigation of Carbon Dioxide (CO_2). The operational energy accounts for 85–95% of the total energy consumption and CO_2 emissions of a building which comes from occupancy through heating, cooling, ventilation, and hot water use (Akadiri P.O., 2012). Thus, many residents concern the energy

efficiency and water management factors when purchasing a property. Collecting rainwater using rainwater and grey water storage for irrigation greatly reduces the consumption of treated water & Rainwater can also be used for household applications (Akadiri P.O., 2012). There have been performed limited peer studies concerning the factors that affect buyers' decisions. This paper is an attempt to fill in the gap of understanding the concerning environmental factors that influence on prospective buyers' purchase decisions.

2. Objective and Hypothesis of the study

The objective of the study is to identify significant influence of the environmental attributes on the purchase decision of customers in respect of luxury apartments in Colombo city and suburbs. Environmental attributes are assumed as the most significant elements for purchase decision of an apartment and research hypothesis developed to understand the level of impact influenced by environmental attributes on economic decision of an apartment purchase.

3. Literature Review

Real estate is a popular and reliable asset class for capital preservation in most countries. It's also an asset with little price volatility. Luxury apartment living portrays a calmer, more prestigious and luxurious life-style with the incorporation of services, facilities and amenities enabling comfortable, enjoyable and convenient living. Condominium has its origin and chief utilization in meeting the need for shelter in land scarce areas. It enables more intensive use of land resources. Some tremendous changes have been taken place in the real estate industry that have changed buyers buying attitude and created opportunities for the real estate sectors. Real estate developers, marketers, policy makers can use the findings to better understand, segment and satisfy the customers. The land scarcity,

urbanization and population pressures have created opportunities for real estate industry and that have significant impact on customers' buying attitude except for the cultural changes and raising price level. It is also found that buying intention is strongly influenced by buying attitude of the customers (Kamal S., 2016). The dynamic interaction of effect and cognition, behaviour, and the environment by which human beings conduct the exchange aspects of their lives.

The natural environment has a significant positive relationship with luxury apartments purchase intention and the previous studies have recognized the importance of environment especially its link to house purchase decision. To many house buyers, housing environment is vital so that they can have a peaceful life and minds living in area which are free from noise, traffic and pollution. In general, house buyers concerned on environmental issues especially towards noise, air pollution and traffic issues and consumers preferred a quiet neighbourhood and scenic value as the most important environment attributes (Chia J., 2016).This convergence of processes and urban intensification has potential long-term ramifications for cities as 'condominium neighbourhoods' emerge in areas where property revolves not around individually owned parcels of land or corporately owned apartment buildings, but rather multiple unit owners subdivided vertically, all living within a shared building that defines their immediate community (Webb, 2017). Residential environmental satisfaction to identify factors which directly contribute to inhabitants' levels of satisfaction with their residential environment, including traffic noise, green areas and social relations (Adriaanse, 2007). The environmental and geographical factors including noise, mountainous, plain, low, and quiet location, location as to main highway, public services availability have a major impact on decision-making when the individual is selecting an apartment (Khrais, 2016). The presence of greenery, forests, water and the

arrangement of those spatial features directly affect buyer attitudes and the value of property (Cellmer R., 2012). Issues such as privacy, open space, ventilation, noise, garbage disposal should be dealt with as these are the most important factors that affect a resident's perspective about the apartment buildings (Hassan S. Z., 2018).

To many house buyers, housing environment is vital so that they can have a peaceful life and minds living in area which are free from noise, traffic and pollution. This present study also recognized the importance of environment especially its link to house purchase decision. It was found that environment has a significant positive relationship with house purchase intention. This finding is consistent with the study done by Zrobek, Trojanek, Sokolnik and Trojanek (2015) (Źróbek, 2015) when their studies amongst Poland consumers found that consumers preferred a quiet neighbourhood and scenic value as the most important environment attributes.

The environmental attributes can be classified into two major categories: Environmental related characteristics and external condition of the luxury apartments (Table 1). These attributes influence the value of the property and also play an important role in the prospective buyers' purchase decision.

Table 1. The attributes of Environmental related characteristics & external conditions of the apartments (Source: (Cellmer R., 2012), (Chia J., 2016), (Webb, 2017), (Adriaanse, 2007), (Khrais, 2016), (Hassan S. Z., 2018) & (Źróbek, 2015))

Environmental related characteristics of the luxury apartments	Environmental related external conditions of the luxury apartments
1. Water Management • Waste Water Treatment • Rain Water Harvesting	1. Scenic Beauty • Open Spaces • Water bodies

2. Energy Efficiency • Solar Energy • Ventilation • Abundant Natural Light	2. Quality of the Neighborhood • Nice Neighborhood • Prestige Neighborhood • Safety Neighborhood 3. Without Air pollution 4. Without Noise Pollution • Noise from Traffic • Industrial Noise

4. Methods

Under the non-probabilistic sampling methods, Convenience Sampling was employed based on the availability the convenience. Sampling elements were individual households and professionals both from the existing customer base and potential customers of real estate property. Customers who are willing to purchase luxury apartment within the study areas and made inquiries from related persons of real estate industry participated in the survey as respondents. One hundred & twenty (120) potential customers were selected for sample size. The respondents include customers with potential characteristics of making an apartment purchase decision and those already have made the decision. As channel of approach, a questionnaire survey was carried out to collect primary data and during the process it was ensured that only potential apartment buyers have filled up the questionnaire physically.

4.1 Study area

Due to the economic growth and infrastructure development, Colombo has experienced urban migration. Colombo and its suburbs are packed with heavy traffic congestion, mix land use pronominally commercial and industrial, higher ratio of built up area and further issues in terms of environmental aspects such as air pollution, odor, polluted water bodies,

noise pollution & poor solid waste management. The development of premium condominium projects is most prominent in the CBD, whereas sub-divided developments, row houses and villas in the peripheral suburbs have emerged as preferred assets for investment amongst the citizens. Western Province & the City of Colombo has rapid growth in residential and commercial segments where new start ups are looking for space in commercial capital.

The local real estate sector contributes greatly to the economic development of the nation being the most profitable and vivacious economic sector. Sri Lanka's property market has grown massively and real estate sector has attracted the attention of locals, foreigners and emigrants. During last few years, skyscrapers have begun to dominate the Colombo's skyline, an attestation to the pulling power that the country is developing with domestic and international investments. Developers are seeking to sell more new apartments to buyers from overseas, taking advantage of Colombo's growing attraction as South Asia's most cosmopolitan city. To attract more foreign buyers for real estate sector, the government's 2017 budget proposed allowing foreign buyers to borrow from a local bank up to 40% of the apartment's value. Some regulations have been relaxed, while others haven't been ratified yet. Even though the government has much to do to attract foreign buyers to Sri Lanka in significant numbers, the on-going actions are keystones for positive growth (Jayasundera, 2017).

4.2 Demographic Characteristics of Respondents

The respondents' profiles are covered in the categories of gender, age, family size, highest educational qualification, occupation, family's total disposable income per month, predecessor residence location and purpose of buying an apartment. The quantitative data analysis; Weighted Average Method was used in analysing the data and it was used to find out the

significance of each attribute that influence on the criteria of buyers' decision.

Table 2: The Profiles Summary of the Respondents' Personal History

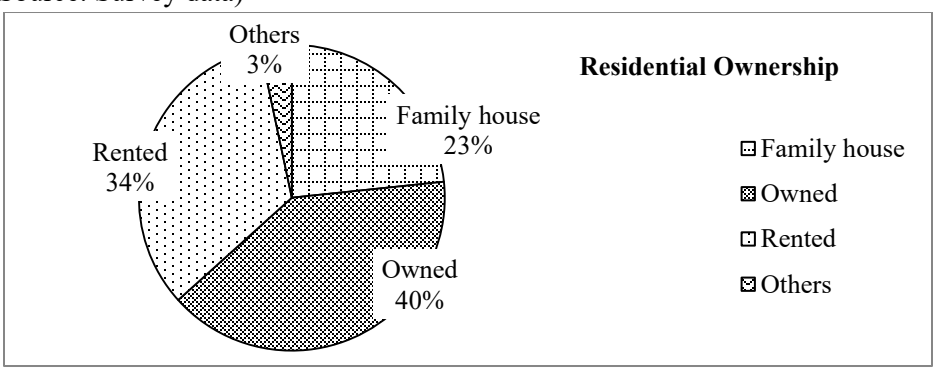
		Frequency	Percentage %
Gender	Male	42	35
	Female	78	65
Age	25 years old or below	3	3
	25-34 years old	9	8
	35-44 years old	17	14
	45-54 years old	26	22
	55-64 years old	28	23
	65 years old or above	37	31
Family size	2 members	24	20
	3 members	32	27
	4 members	36	30
	5 members	19	16
	more than 5 members	9	8
Education	Primary	0	0
	Secondary	0	0
	Dip.	9	8
	Bachelor	18	15
	Master only	40	33
	PHD	2	2
	Professional Q. only	51	43
Occupation	Business	39	33
	Professional	8	7
	Govt: Service	3	3
	Private	43	36
	Other	27	23
Income Level (Rs. miliion)	<0.05	8	7
	0.051–0.1	30	25
	0.1 – 0.15	35	29
	0.15 – 0.2	26	22
	0.2- 0.4	16	13

	>0.4	5	4

4.3 The Status of Residential Ownership and Customers Intentions

The figure 02 has shown the maximum 40% of respondents are stayed on their own residencies, 33% of the respondents have sated at rental basis, 24% of the respondents have sated family houses and 3% of respondents are in others category, which include residence on lease or staying at relative. The people who are staying at rental basis, family houses, residence on lease or staying at relatives' place have made inquiries on condominium apartments for purchase.

Fig. 2: The attributes residential ownership of the respodents
(Source: Survey data)



According to the figure 03, there were 17% of respondents have already purchased the condominium apartments from Nugegoda, Mattegoda, Kottawa, Battaramulla, Pelawatta, Athurugiriya, Boralesgamuwa and Kiribathgoda areas. Other 83% of did not have purchased a partment and According to the figure 04, 75% of customers searching for the apartments to purchase within next 2 years in Colombo 08, Colombo 07, Colombo 4, Colombo 03, Kiribathgoda, Kadawata, Pelawatta, Maharagama, Homagama, Kottawa and Rajagiriya. Most probably they will be the owners

of condominium apartment located in the city of Colombo and suburbs by 2020.

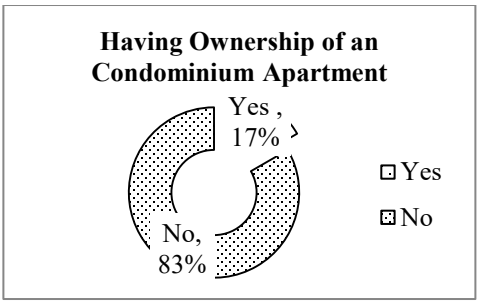


Fig. 3: Having Ownership of a Condominium Apartment (Source: Compiled by Author)

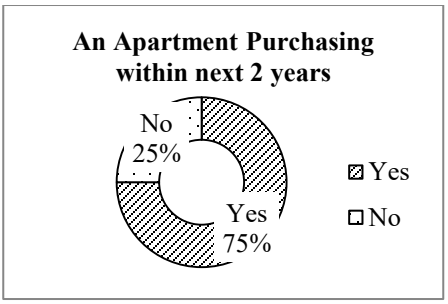
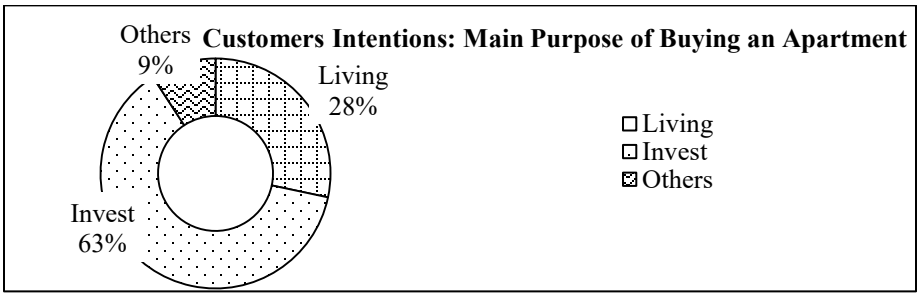


Fig.4: Willingness to Purchase an apartment within next 2 years (Source: Compiled by Author)

Figure 05 shows that, maximum 63% of respondents purchase the apartment as investment, 28% of respondents' purchase the apartment for living purpose and 9% were purchase for other purposes. Living and investment were main two purpose were identified for purchasing the condominium apartment. Apart from that the most of the reputed companies are going to purchase the luxurious condominium apartment within the Colombo city as their company assets and specially provide accommodate their foreign visitor or investors.

Fig. 05: Main Purpose of Buying an Apartment (Source: Compiled by Author)



According to the figure 06, there are 77% of customers who are purchased apartment for living is for family and 23% of other reasons of apartment purchasing such as transit place (staying weekdays, apply for schools and etc.). There are customers who are purchased apartment for living is for family and other reasons of apartment purchasing such as transit place (staying weekdays, apply for schools and etc.) According to the figure 07, the investment (for the rent or for the resale) is the main purpose of buying an apartment. According to the sales person's opinions, majority of the apartment buyers preferred to rent the apartments for the foreigner. The apartment owners can resale the new apartment with profit of 200% in most of the circumstances.

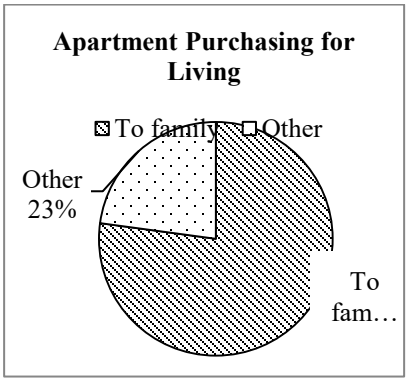


Fig. 06: Apartment Purchasing for Living (Source: Compiled by Author)

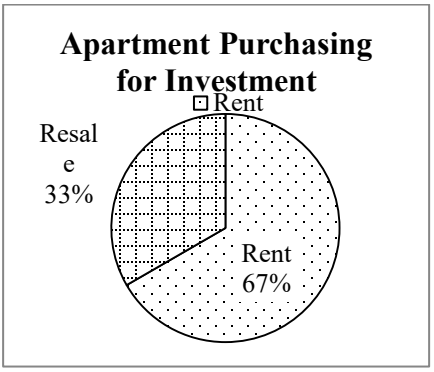


Fig. 07: Apartment Purchasing for Investment (Source: Compiled by Author)

5. Results and Discussion

The selected sample contained 65% of female respondents and the perception towards environmental factors by gender and age is an important finding to assess the variance. Noise from traffic (surrounding), solar energy use, internal ventilation, abundant natural light, water bodies, nice neighborhood, availability of waste water treatment plant and rainwater harvesting were the most responded environmental attributes of prospect female buyers. The most responded environmental attributes of prospect female buyers were noise from industries, air pollution, open spaces availability, prestige neighborhood & safe neighborhood. The prospective customers belong to age group of 35-55 years old were mostly responded to environmental attributes namely Noise from traffic (surrounding), solar energy use, internal ventilation, abundant natural light, water bodies, nice neighborhood, availability of waste water treatment plant, noise from industries, air pollution, open spaces availability, prestige neighborhood & safe neighborhood. The environmental attributes of water bodies & availability of rainwater harvesting were mostly responded by the customers who are 55 years old and more.

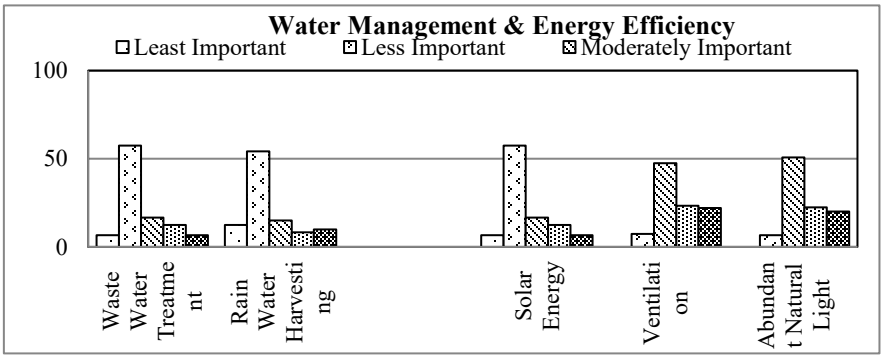


Fig. 8: The attributes of Water Management & Energy Efficiency
(Source: Compiled by Author)

5.1 Environmental related characteristic of luxury apartments

5.1.1 Water Management & Energy Efficiency

The attributes of Waste water management and Rain water harvesting were considered under the water management of the apartment building. According to fig. 1, there are 58% of respondents have considered waste water treatment as less important and 54% of customers have considered rain water harvesting as less important.

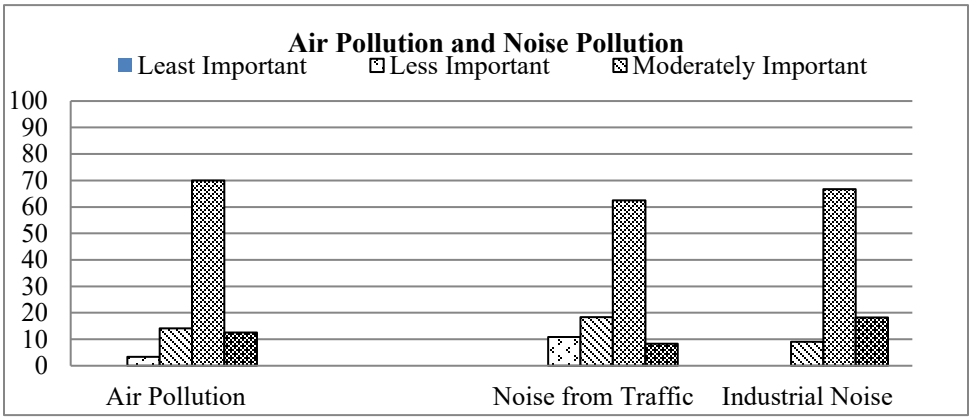
Solar energy generation of the apartment, having more natural ventilation and abundant natural light were considered as the attributes under the energy efficiency sector. There are 58% of customers have considered solar energy as less important, 48% of customers have considered ventilation as moderately important and 51% of customers have considered solar energy as moderately important.

5.2 Environmental related external conditions of the luxury apartments

5.2.1 Air Pollution and Noise Pollution

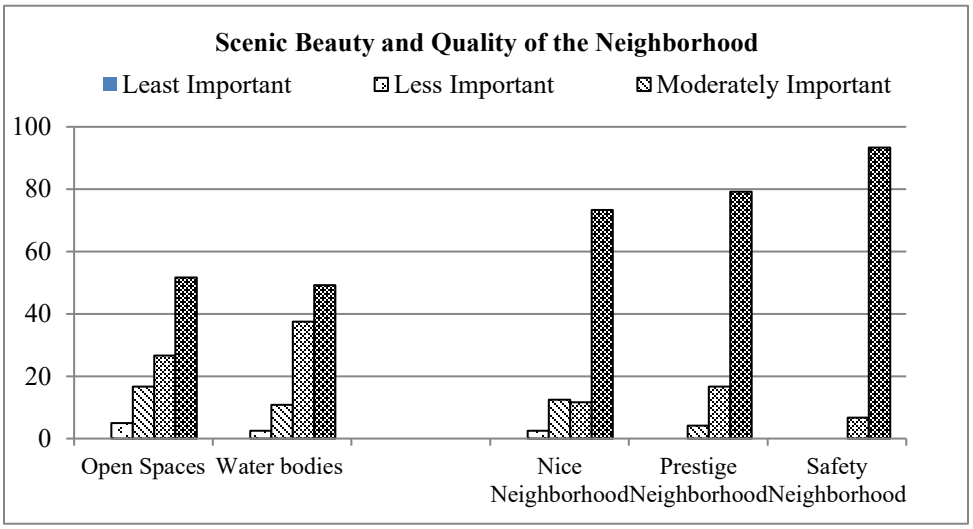
According to the Fig. 2, there are 70% of customers have considered the air pollution as important attribute. Noise from traffic and industrial noise were identified as attributes under noise pollution sector. There are 63% of customers have considered noise from traffic as important & 67% of customers have considered industrial noise as important.

Fig. 2: The attributes of Air Pollution, Noise Pollution and Scenic Beauty (Source: Compiled by Author)



5.2.2 Scenic Beauty and Quality of the Neighborhood

Fig. 3: The attributes of Scenic Beauty and Quality of Neighborhood (Source:



Compiled by Author)

Open spaces and water were identified as attributes under the scenic beauty. According to the Fig. 3, 52% of customers have considered open spaces as most important & 49% of customers has considered water bodies as most important element.

Nice neighborhood, prestige neighborhood and safety neighborhood were identified as attributes under the Quality of the Neighborhood. According to the Fig. 3, 73% of customers have considered nice neighborhood as the most important element. 79% of customers have considered prestige neighborhood as the most important while 93% of customers have considered safety neighborhood as the most important element.

To further analyze the common environmental features that respondents consider before making a purchase decision of an apartment, factor analysis has been conducted by using SPSS Statistics Data Editor. Based on the survey, total of 13 variables were used for factor analysis to identify principle components which determine the environmental features of

purchasing an apartment. Kaiser-Meyer-Olkin Measure (KMO) is obtained as 0.638 which is considered as acceptable for the analysis. The minimum value of 0.6 for factor loading has been considered to be a significant contribution for the correlation. By considering the communalities score, the results are shown in Table 2.

Table 2. Communalities recorded for variables (Source: Compiled by Author)

No.	Variable	Initial	Extraction
1	Air Pollution	1.000	.647
2	Noise from Traffic (surrounding)	1.000	.535
3	Noise from Industries	1.000	.687
4	Solar Energy Use	1.000	.670
5	Internal Ventilation	1.000	.805
6	Abundant Natural Light	1.000	.765
7	Open Spaces Availability	1.000	.406
8	Water Bodies	1.000	.795
9	Feeling of Nice Neighborhood	1.000	.574
10	Feeling of Prestige Neighborhood	1.000	.467
11	Feeling of Safe Neighborhood	1.000	.440
12	Availability of Waste Water Treatment Plant	1.000	.130
13	Availability of Rainwater Harvesting	1.000	.777

Extraction Method: Principal Component Analysis

Due to the lack of significance for the correlation, variables with a value of less than 0.600 are removed and resulted in removal of 6 variables. So the factor analysis has been conducted for 7 variables with comparatively higher significance (highlighted in bold text in Table 2). Upon removal of low communalities which do not provide a significant contribution to the factors, factor analysis has been conducted in SPSS.

Based on the total variance achieved for the considered variables, 03 factor loadings were identified with initial eigenvalues of 1 or more. Total variance for the selected 7 variables are as shown in Table 3.

Table 3. Total Variance Explained (Source: Compiled by Author)

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	2.582	36.881	36.881	2.582	36.881	36.881	2.535	36.218	36.218
2	1.165	16.648	53.529	1.165	16.648	53.529	1.195	17.076	53.294
3	1.064	15.205	68.734	1.064	15.205	68.734	1.081	15.440	68.734
4	.924	13.198	81.932						
5	.720	10.291	92.223						
6	.403	5.762	97.985						
7	.141	2.015	100.000						

Extraction Method: Principal Component Analysis

The scree plot visualizes the sudden drop of Eigenvalues from the 4th component onwards. So it is visible that environmental factors which determine the purchase decision of luxury apartments can be identified in 3 major categories. Based on the responses made by 120 individuals, principle component matrix was calculated with 3 components extracted.

Due to significant amount of cross loadings in the principal component matrix, redistribution of factor loadings was considered. In SPSS, Varimax (Variable Maximization) rotation is used to calculate the rotated component analysis. Based on the rotated component analysis, 03 clusters were

identified with high correlation between variables. The updated component matrix is as shown in Table 04.

Table 4. Rotated Component Matrix [a] (Source: Compiled by Author)

No.	**Component**		
	1	**2**	**3**
Internal Ventilation	.825	-.388	
Abundant Natural Light	.798	-.407	
Noise from Industries	.781		
Solar Energy Use	.766		
Air Pollution		.855	
Availability of Rainwater Harvesting			.771
Water Bodies			.668

"Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization."

[a] Rotation converged in 5 iterations.

Based on the factor loadings, the perception of people which determine the purchase decision of a luxury apartments can be categorized into 3 main environmental factors.

- Energy Efficiency and Natural Light & Ventilation
- Air Quality in the surrounding
- Water Management and Scenic Beauty

By considering the relationship between variables, it is visible that people focus on energy, air, water management and scenic beauty before making a purchase decision of a luxury apartment.

As per the factor analysis, the most significant factors for buyers' decision on apartment purchase are internal ventilation (0.805), proximity to waterbodies (0.795), abundant natural light (0.765) and availability of

rainwater harvesting options (0.777). This depicts that out of all environmental factors, water, natural light & ventilation are most considered factors. To understand how each of these factors relate to each other, a correlation analysis is undertaken. The most significant variables are considered for the correlation analysis in SPSS. Pearson bivariate correlation is undertaken with two-tailed significance on the results.

Table 5. Correlation Matrix of most Significant Variables (Source: Compiled by Author)

		Ventilation	Abundant Natural Light	Proximity to Waterbodies	Rain Water Harvesting
Ventilation	Pearson Correlation	1	.848**	.115	-.040
	Sig. (2-tailed)		.000	.212	.668
	N	120	120	120	120
Abundant Natural Light	Pearson Correlation	.848**	1	.057	-.050
	Sig. (2-tailed)	.000		.534	.589
	N	120	120	120	120
Proximity to Waterbodies	Pearson Correlation	.115	.057	1	.061
	Sig. (2-tailed)	.212	.534		.507
	N	120	120	120	120
Rain Water Harvesting	Pearson Correlation	-.040	-.050	.061	1
	Sig. (2-tailed)	.668	.589	.507	
	N	120	120	120	120

**. Correlation is significant at the 0.01 level (2-tailed)

According to table 5, it is clear that natural light and ventilation has the highest significance ($\alpha<0.01$) with strong positive correlation of 0.848.

waterbodies and ventilation has positive weak relationship (0.115) while it is with natural light has even weaker relationship (0.057). Rainwater harvesting options has negative weak relationship with ventilation and natural light (-0.040 and -0.050 respectively) while waterbodies and rainwater harvesting options has weak positive relationship of 0.061. This shows that out of most common environmental factors, prospective buyers consider upon natural light and ventilation as most significant factors before deciding the purchase decision while proximity to waterbodies and rainwater harvesting are considered independently during the decision making process for luxury apartments.

6. Conclusion

Out of the 13 attributes, 05 attributes namely open spaces, water bodies, nice neighborhood, prestige neighborhood & safety neighborhood are identified as the most important, 03 attributes namely air quality, noise from traffic & industrial noise are identified as important, 02 attributes namely ventilation & abundant natural light are identified as the moderately important and the remaining 03 attributes namely waste water treatment, rain water harvesting & solar energy are identified as the less important. This paper gives a deeper understanding of potential buyers' behavior and preferences on purchase of luxury apartments particularly in Colombo and suburbs.

Based on the factor analysis, it can be concluded that people are more concerned on important factors which are available within the apartment complex. Also the external and internal environmental factors are prime focus on customer behavior of making the purchase decision. Ventilation, natural lighting, solar energy availability and rainwater harvesting techniques are considered by people with relation to internal factors. It is clear that water and energy independence as key consumer needs is increasingly popular among people. So from environmental perspective,

sustainable water and energy management techniques are more concerns by the people than neighborhood quality parameters. This shows that future luxury apartment market will be driven by clean energy sources and sustainable water management practices as consumers are giving priority for such factors. Next important factor within the internal variables is that consumers give comparatively less priority for waste water treatment within the premises. This may be mainly due to the fact that City of Colombo has sewer network which is connected by most of the residential apartments. Therefore, people have given less priority to treatment of waste water within the premises. Since waste water treatment comes under common utility services for total community within the apartment complex, the lack of priority shows that people are more concerned on environmental factors affecting the apartment itself than common resources within the complex.

Out of the external environmental factors, scenic beauty, air and water pollution control are major considerations before purchasing an apartment. This means that people prefer apartments with a view of water body than open spaces. This reveals the importance of waterfront for future development of luxury apartments in Colombo. Also the good quality air and calm and quiet environment are major factors determining the purchase decision of buyers. This is a significant improvement of consumers where depletion of air quality in Colombo can directly affect the real estate market of apartments as consumers value the ventilation and air quality as prime concerns. Also the quality of neighborhood which is determined by the feelings of prestige, safety and nice environment are given less priority by the consumers in purchasing a luxury apartment. So it is interesting to see that spatial identity and personal values might not be the major factors for people to make buying decision. So, prestige identities that were identified in past in locations like Cinnamon Gardens in Colombo may not be the prime decision for buyers in terms of environmental factors' concern. But this may determine some other factors like the land values, traffic

congestion, etc. and increasing distribution of luxury apartments along water fronts, ocean fronts may correlate with the fact that people prefer scenic beauty over personal prestige feeling within the neighborhood.

This research is important not only for investors, but also the urban planning professionals to understand the user behavior in providing spaces for apartments in urban areas. Also this proves that natural environmental quality has been an important factor in response to rapid urbanization in cities like Colombo. The real estate development should also must be the creation of neighborhoods with natural elements and renewable resources to attract residential communities within it. Town planners can use the results of this study to assess the match between the existing regulatory framework (planning and building regulations) for real estate market – especially luxury apartment sector – and requirements of the buyers to make a crucial life decision.

This research can be further expanded to assess the perception of buyers towards internal and external factors within an apartment after making the purchase. So the comparison of pre and post purchase of apartments could be analyzed to evaluate the change of behavior and factors affecting the use of apartment after the purchase decision. Also this research would be useful to measure the sustainable development goals and the level of achievement by urban areas in terms of luxury apartment market.

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References

a) *Adriaanse, C.,(2007). Measuring residential satisfaction: a residential environmental satisfaction scale (RESS). Journal of Housing and the Built Environment, 22(3), p. 287.*
b) *Akadiri P.O., Chinyio. E.A. &. Oomolaiye. P.O.., (2012). Design of A Sustainable Building: A Conceptual Framework for Implementing Sustainability in the Building Sector. Buildings, pp. 126 - 152.*
c) *Cardella, E. & Seiler, M. J., 2016. The effect of listing price strategy on real estate negotiations: An experimental study. Journal of Economic Psychology, pp. 71-90.*
d) *Cellmer R., Senetra. A. &. Szczepanska. A., 2012. The Effect of Environmental Factors on Real Estate Value. Knowing to manage the territory, protect the environment, evaluate the cultural heritage Rome, Italy, pp. 1-13.*
e) *Chia J., Harun A., Kassim. A. W., Martin. D &. Kepal. N., (2016). Understanding factors that influence house purchase intention among consumers in Kota Kinabalu: an application of buyer behavior model theory. Journal of Technology Management and Business, 3(2), pp. 94-110.*
f) *Hassan S. Z., Naeem. M. A., Waheed. A. &. Thaheem. M. J., (2018). Assessment of socio-economic profile and residents' satisfaction living in apartments and single unit houses in Islamabad, Pakistan. International Journal of Strategic Property Management, 23(5), p. 284–297.*
g) *Jayasundera, D., 2017. ECHELON. [Online] Available at: http://echelon.lk/home/five-trends-in-sri-lankas-condo-market/*
h) *Kamal S., Sarker. O. F. &. Pramanik. S. A. K.,(2016). Investigation of Market Factors That Affect Customers' Buying Attitude towards Apartment Buying: An Opportunity Analysis from Bangladesh Perspective. International Journal of Business Administration Vol. 7, No. 3, pp. 153-165.*

i) *Khrais, M. I., 2016. Factors Affecting The Jordanian Purchasing Behavior of Housing Apartments: An Empirical Study In Irbid City. European Scientific Journal, 12(7), pp. 446-458.*

j) *Kiefer, H., 2007. Essays on applied spatial econometrics and housing economics, Ohio: Ohio State University.*

k) *Ratnasingham, A., 2015. Sri Lanka's capital skyline changes with rise in luxury apartment market: report. [Online] Available at: https://www.lankabusinessonline.com/sri-lankas-capital-skyline-changes-with-rise-in-luxury-apartment-market-report/*

l) *Webb, B. &. Webber. S., 2017. The implications of condominium neighbourhoods for long-term urban revitalisation. Cities, p. 48–57.*

m) *Źróbek, S. Trojanek M., Źrobek.-S. A. &. Trojanek. R., (2015). The influence of environmental factors on property buyers' choice of residential location in Poland.. Journal of International Studies, 7(3), pp. 163-173.*