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Identifying Environmental, Social and Governance (ESG) Factors as Key Factors in Residential and Commercial Properties/Real Estate Investment Decision

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Abstract: *ESG factors in recent times has become increasingly important in real estate investment decisions hence, this study x-rays the need to consider these factors in residential and commercial properties. The study identified some factors that influence ESG in residential and commercial properties. The principal component analysis done for factors in respect to residential properties identifies these factors and they include; employee wellbeing, community engagement, transportation access, biodiversity, energy efficiency, indoor air quality, waste management and green certification. The analysis done shows that employee wellbeing is ranked first, followed by community engagement. Green spaces rank seventeenth. In The study also identifies factors affecting ESG in commercial properties, such as employee well-being, community health impact, sustainable design, indoor air quality, transportation access, energy efficiency, patient safety and green certification. The study concludes that the real estate sector plays a crucial role in shaping the future of our planet.*
Keywords: commercial, ESGS, investment decision, real estate and residential

INTRODUCTION

The real estate sector is a significant contributor to global economic activity and as such, plays a crucial role in shaping the future of our planet, (Patterson, 2013). In recent years, investors, developers, and property owners have come to recognize the importance of integrating environmental, social, and governance (ESG) factors into their decision-making processes, (Mahanama, Shirvani, Rachev & Fabozzie, 2023). ESG considerations are no longer viewed as secondary to financial returns but rather as essential components of a comprehensive investment strategy, (Zhan, 2023).

Environmental factors, such as energy efficiency, water conservation, waste management, and resilience to climate change, are increasingly important in assessing the long-term

sustainability and value of residential and commercial properties, (Meins & Sager, 2015). Social factors, including community engagement, tenant satisfaction, and access to amenities, also impact property values and investment performance, (Ellison, Sayce & Smith, 2007). Governance factors, such as transparency, accountability and ethical business practices, are vital in ensuring that investments are managed responsibly and with integrity, (Pivo, 2008).

Incorporating ESG factors into real estate investment decisions will allow investors mitigate risks, capitalize on opportunities and contribute to a more sustainable and equitable built environment, (Шапсугова, 2023). This integrated approach not only enhances investment returns but also supports the well-being of occupants, the community and the environment, (Nirmul & Scott, 2020).

In this context, identifying and evaluating ESG factors in residential and commercial properties has become a critical component of informed investment decision-making. By doing so, investors can ensure that their portfolios align with their values, manage potential risks and seize opportunities for long-term growth and sustainability. This work is therefore aimed at identifying and evaluating ESG factors in residential and commercial properties with a view to improving sustainability, ethical practice and overall impact on the environment and safety.

REVIEW OF RELATED LITERATURE

Real estate investment decisions are becoming more sophisticated and are multi-faceted with investors who may need to consider many factors that will help them in making informed choices/decision. The real estate sector is increasingly appreciating the role of Environmental, Social and Governance (ESG) factors in investment decisions. More so, the sector plays and still appears to be still playing a pivotal role in shaping the built environment with huge or noticeable impacts on the economy, society and the environment, (Zhan, 2023). As investors, developers and property owners seeks opportunities/avenues aimed at maximizing their returns on investment while minimizing risks, ESG factors appears to have emerged as force to reckon with in investment decisions. In recent times, attention has been shifted on the importance of environmental, social and governance (ESG) factors in making real estate investment decision, (Maiti, 2020). ESG factors consider the impact of the environment on a property, its social impact on the neighbouring community as well as the governance practices of the entity that manages the property, (Izyumov, 2023).

The environmental impact of a property has over the years appears to be critical issues to real estate investors. Environmental factors is a term used to refer to external influences that can affect the value and desirability of a property and it includes physical, social, natural and economic elements, (Jackson, 2001). The impact of environmental factors on property values, rental income and investment returns appear to be enormous, (Sandbhor & Chaphalkar, 2016). They influence the sustainability of a property, its attractiveness, usability while affecting ultimately its financial performance, (Lorenz & Lützkendorf, 2011).

With the ever growing concerns on climate change and depletion of the natural resource, investors appear to have increased their search for properties that are environmentally

sustainable and energy efficient. Green building certifications, such as Leadership in Energy and Environmental Design (LEED) and Building Research Establishment Environmental Assessment Method (BREEAM), have become more popular and best sought for among investors, (Gültekin, Yıldırım and Harun Tanrıvermiş, 2018). This is seen as a way aimed at evaluating the environmental performance of a property. More so, studies have shown that green buildings have the capacity to command higher rents and help in attracting quality tenants thus, leading to improvement in the financial performance for investors, (Hin Ho, Rengarajan & Han Lum, 2013). Green buildings appear to be more resilient to risks associated with climate change, such as weather events that are extreme, (Reddy, 2016).

In consideration of environmental factors, there is need to explore strategies that will be aimed at incorporating environmental considerations. One of which is environmental risk assessment where identification of potential environmental hazards is of great importance. Environmental risk assessment deals with the identification and the evaluation of the potential environmental hazards which can impact on the value of a property or pose risks to health and safety, (Vazdani, Sabzghabaei, Dashti, Cheraghi, Alizadeh & Hemmati, 2017). This process deals with conduct of thorough due diligence aimed at assessing the factors such as soil air pollution, contamination, water quality, as well as other environmental risks. Identification of potential environmental hazards early stage of real estate investment process could investors can make informed decisions on whether to proceed or not with such investment with as well as implementation of risk management strategies aimed at mitigating any identified risks, (Muka & Boy, 2021). Assessments of environmental risk also help investors compiling with regulatory requirements and demonstration of their commitment to environmental stewardship, (Dvorak, Gonzalez, Artola, Lopez, Juan & Nicholas, 2016).

The second strategy is sustainable development which is more of investment in eco-friendly and energy-efficient properties. Investment in sustainable development practices is no doubt another key strategy for incorporating environmental considerations in real estate investment decision-making, (Mouzughi, Bryde & Al-Shaer, 2014). Sustainable development involves the design, construction and management of properties by a way which includes minimization of environmental impact, promotion of resource efficiency and enhancement of long-term value, (Razali, Yunus, Zainudin & Lee Yim Mei, 2017). Practices of sustainable development in real estate sector may include the incorporation of energy-efficient features, through the use of environmentally friendly materials, implementation of water conservation measures and promotion of green building certifications such as Leadership in Energy and Environmental Design (LEED) or Building Research Establishment Environmental Assessment Method (BREEAM), (Horsley, France & Quatermass, 2003).

The third strategy is location analysis and this involves the evaluation of proximity to environmental amenities and hazards. Proximity to environmental amenities such as green spaces, parks and water bodies can help in the enhancement property value, attraction of buyers and tenants that are looking for sustainable living options, (Sharmin, 2020). Conversely, proximity to sources of environmental hazards such as of pollution or areas prone to flood can pose risks to the property value as well as occupants, (Li, Hu & Liu, 2020).

The fourth strategy is stakeholders' engagement which involves the collaboration with local communities and environmental groups. Engagement with local communities and environmental groups can aid in the provision of valuable insights into the environmental concerns that are specific to a property or its surrounding area, (Martínez & Olander, 2015). Collaboration with stakeholders will help investors gain a thorough and deeper understanding of the community's needs and priorities related to sustainability, (Setiawan & Muhammad, 2018). This engagement can help in the identification of opportunities aimed at the implementation of environmentally friendly practices which includes green building certifications, installations of renewable energy or community initiatives which support environmental conservation, (Ogunba, Dabara & Gbadegesin, 2021). The involvement of stakeholders in the decision-making process can help in building investors trust, fostering of relationships that are positive and creation shared value for all stakeholders, (Reinman, 2015).

Social factors which include the impact of a property on the neighbouring community have also become a force to reckon with in by real estate investors. There is an increase in the recognition of the importance of investment in properties whose contributions are positive to the local community as well as in supporting the well-being of residents by investors, (Scheepers & Bloom, 2015). These social factors under considerations may include; proximity to schools, public transportation and access to same, healthcare facilities including social interaction opportunities within the neighborhood. Studies in the past have shown that properties which are located within walkable, mixed-use neighborhoods with access to good amenities tend to command rents which are higher as well as property values, (Gilderbloom & Meares, 2020). Investment in properties which contributes to the social well-being of the community can also help in the reduction of vacancy rates and in the improvement of tenant retention thus, leading to better returns for investors, Olujimi & Bello, (2009).

For real estate investors, governance factors i.e. the management practices of the entity responsible for management of property are also important. Investors are more concerned now and are looking for properties that are transparently and ethically managed while focusing on sound corporate governance practices, (Jayne & Skerratt, 2003). Here, emphasis is placed on issues such as the diversity of the board of directors, the executive compensation and alignment with long-term performance and as well as how to implement robust risk management practices. Studies in the past have shown that properties that are managed by firms with greater governance practices tend to perform better than their peers especially in terms of long-term value creation and financial performance, (Khan et al., 2020). Investment in properties with sound governance practices helps in the reduction of the risk of fraud, misconduct, protection of the investor's interests and enhancement the reputation of the property in the market.

The issue of transparency, executive compensation, board diversity and effectiveness of audit committee are critical indicators on governance that influences investment decisions, (Uzma, 2018). Also, considered essential for maintenance, reputation and avoidance of regulatory risks are business practices are hinged on ethics, compliance of regulation and risk management practices, (Othman, Ishak, Arif & Aris, 2014).

Environmental, social and governance factors are becoming appears to becoming crucial factors to be considered by real estate investors especially in making investment decisions. So,

investment in properties that are sustainable environmentally wise, responsible socially and well-governed can help in improving financial performance, protection of the long-term value of the investment as well as in positive contribution of the well-being of the neighbouring community, (Pivo, 2008). As the awareness of the importance of ESG factors continues to grow in the real estate sector/industry, there is need investors to adapt their decision-making processes especially in the incorporation of these considerations into their investment strategies, (Maiti, 2020). The consideration of ESG factors together with traditional financial metrics can help investors in the making of more informed decisions that benefit their portfolios and the society, (Alford, 2019).

METHODOLOGY

In identifying environmental, social and governance (ESG) factors as key factors in residential and commercial properties/real estate investment decision, mixed-methods research design was employed. This design incorporates both quantitative and qualitative methods to obtain a comprehensive understanding of the topic. A structured questionnaire was developed to gather quantitative data from Real Estate Valuers. The use of 5 point likert scale e.g. strongly agree (SA), agree (A), neutral (N), disagree (D) and strongly disagree (SD) was employed. The survey includes questions related to the importance of ESG factors especially on residential and commercial properties. The research design includes survey as well as interview. Structured questionnaire were distributed to Estate Surveyors and Valuers. Online survey platforms (google form) or email distribution including hard copy questionnaires were used for data collection. A purposive sample of Estate Surveyors and Valuers were interviewed especially the ones with expertise in ESG factors. The methods of analysis were descriptive and inferential. Descriptive statistics were used to determine frequency distributions, mean scores and standard deviations for different variables related to ESG factors. An inferential statistical test such as mean rank and factor analysis was used.

Data Presentation and Analysis

Background Information of Respondents

The information shows the background information of the respondents and this include: gender, highest educational qualification, professional cadre, registered estate surveyor and valuers, years of experience.

Table 1

Gender	**Frequency**	**Percentage**
Male	255	58.6
Female	180	41.4
Highest educational qualification	**Frequency**	**Percentage**
HND/BSC/BTECH	285	65.5
MSC/MTECH	80	18.4
PHD	70	16.1
Professional cadre	**Frequency**	**Percentage**
Probationer	300	68.9
Associate	100	22.9
Fellow	35	8.0
Registered Estate Surveyors and Valuers	**Frequency**	**Percentage**
Yes	135	30.03
No	300	69.97
Years of Experience	**Frequency**	**Percentage**
0-5	240	55.2
6-10	120	27.6
11-15	50	11.5
16 & above	25	5.8
Total	**435**	**100.00**

Source: Field survey, 2024

The information in table 1 revealed the demographic information of respondents in this order; there were more male respondents than female respondents which could be due to high percentage of male in the real estate sector. According to level of educational qualification, 65.5% of the respondents were HND/BTECH Holders which comprises of the high percentage of respondents; this was followed by MSC/MTECH while PHD Holders ranked as the least. It was also revealed that a high percentage of the respondents were registered estate surveyors and valuers while a high percentage of the respondents had 0-5 years of experience followed by 6-10, 11-15 and 16- above respectively.

Table 2: Factors considered in valuing identified classes of properties: Residential

Descriptive Statistics

	N	Mean	Rank
Green spaces	435	2.55	17th
Customers health and safety practices	435	2.88	16th
Quest for certification	435	2.96	15th
Employment, health and safety practices	435	2.99	14th
Water conservation	435	3.01	13th
Ethical supply chain	435	3.05	12th
Resilience climate change	435	3.05	12th
Sustainable sourcing	435	3.06	11th
Sustainable design and materials	435	3.09	10th
Patient safety	435	3.11	9th
Community health impact	435	3.13	8th
Green certification	435	3.14	7th
Waste management	435	3.14	7th
Indoor air quality	435	3.15	6th
Energy efficiency	435	3.18	5th
Biodiversity	435	3.19	4th
Transportation access	435	3.30	3rd
Community engagement	435	3.33	2nd
Employee well being	435	3.42	1st
Valid N (listwise)	435		

Source; Field survey, 2024

According to the information on table 2, employee wellbeing ranked 1st with mean score of 3.42, community engagement ranked 2nd with mean score of 3.33, transportation access ranked 3rd with mean score of 3.30, biodiversity ranked 4th with mean score of 3.19, energy efficiency ranked 5th with mean score of 3.18, indoor air quality ranked 6th with mean score of 3.15, waste management and green certification ranked 7th with mean score of 3.14.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.780
Bartlett's Test of Sphericity	Approx. Chi-Square	1598.435
	Df	171
	Sig.	.000

Source: Field survey, 2024

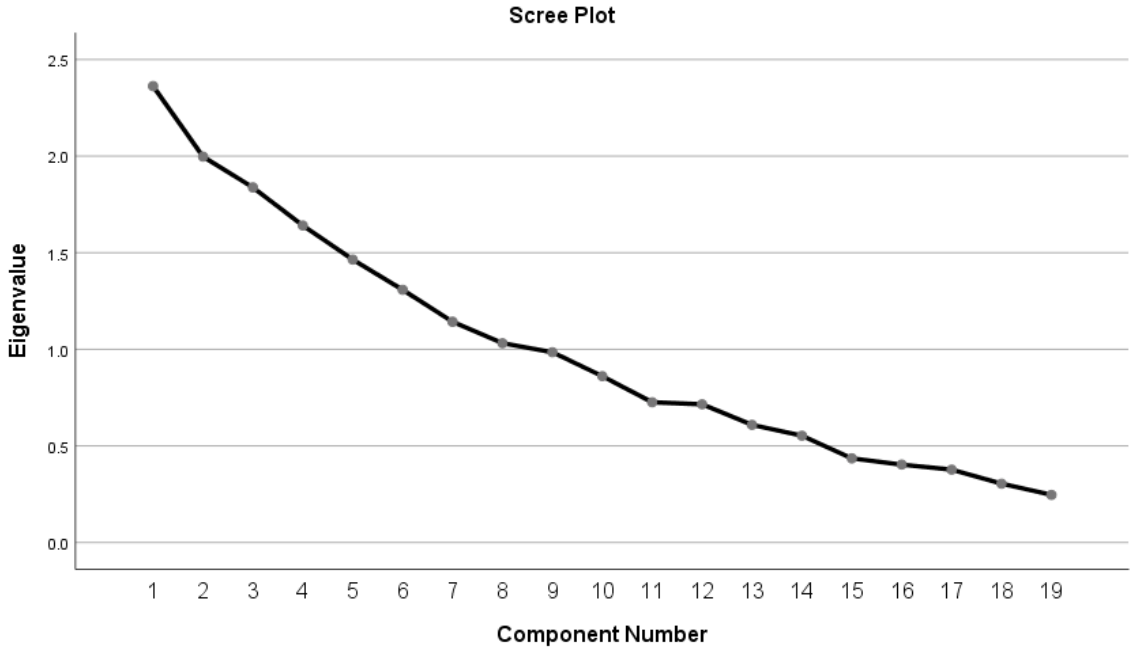
Kasier-Meyer-Olkin's measure of sampling adequacy and Barlett's Test of sphericity are presented in Table 3 above. KMO measure is performed to check the degree of inter-correlation among the items and the appropriateness of factor analysis. Kim and Mueller (1978) suggested that KMOs in the range of 0.5-0.7 are considered average, those in the range of 0.7-0.8 are considered good while those in 0.8-0.9 are great and values greater than 0.9 are superb. The table above shows that the KMO values obtained are in the range of 0.78 which indicates that the sample is good.

Table 4: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.362	12.432	12.432	2.362	12.432	12.432
2	1.997	10.513	22.945	1.997	10.513	22.945
3	1.838	9.673	32.618	1.838	9.673	32.618
4	1.641	8.635	41.254	1.641	8.635	41.254
5	1.465	7.708	48.962	1.465	7.708	48.962
6	1.308	6.885	55.847	1.308	6.885	55.847
7	1.142	6.012	61.859	1.142	6.012	61.859
8	1.032	5.429	67.289	1.032	5.429	67.289
9	.985	5.183	72.472			
10	.861	4.532	77.003			
11	.726	3.821	80.824			
12	.715	3.765	84.589			
13	.609	3.203	87.792			
14	.553	2.910	90.702			
15	.435	2.292	92.994			
16	.403	2.122	95.116			
17	.377	1.984	97.101			
18	.304	1.602	98.703			
19	.246	1.297	100.000			

Extraction Method: Principal Component Analysis.

Table 4 shows that Principal Component Analysis was conducted and eight components were extracted for the factors identified in valuing residential property and it only retained those components whose variance is greater than 1.0. The factors revealed the presence of six axes with eigenvalues exceeding 1.0, explaining 12.432%, 10.513%, 9.673%, 8.635%, 7.708%, 6.885%, 6.012%, 5.429% of the total variance respectively and resulting with a cumulative variance of 67.289%. The principal factors influencing ESG in residential properties are: employee wellbeing, community engagement, transportation access, biodiversity, energy efficiency, indoor air quality, waste management and green certification. It could be said that, all other factors are related but contributed in small measures as revealed by factor analysis.



The scree plot shows that after the first two components, the difference between the fourth and fifth eigenvalues increased and then gradually declined and became more or less than 2.0, approximately at 1.86 after component five. The first component explains 12.432% of the total variance at 2.362, the second component explains 10.513% of the total variance at 1.997, the third component explains 9.673% of the total variance at 1.838, the fourth component explains 8.635% of the total variance at 1.641, the fifth component explains 7.708% of the total variance at 1.465, The sixth component explains 6.885% of the total variance at 1.308, the seventh component explains 6.012 of the total variance at 1.142, the eight component explains 5.429 of the total variance at 1.032. Thus, the factors influencing ESG in residential properties are: employee wellbeing, community engagement, transportation access, biodiversity, energy efficiency, indoor air quality, waste management and green certification.

Table 5: Component Matrix[a]

	Component							
	1	2	3	4	5	6	7	8
Energy efficiency	.104	-.253	-.007	-.052	.158	.047	-.701	.193
Water conservation	.389	.004	.021	.310	-.025	.351	.089	.415
Waste management	.053	-.042	.670	.471	-.007	.000	-.154	-.026
Indoor air quality	.250	.487	-.010	-.243	-.205	-.202	-.021	-.435
Green certification	-.334	.443	-.121	-.326	-.468	.268	.066	.226
Community engagement	.441	.375	.421	-.227	-.079	-.030	-.168	-.065
Sustainable sourcing	.484	.280	.386	.039	.285	-.194	.393	.136
Employment, health and Safety practices	.451	-.051	-.506	.150	.160	.360	.105	-.334
Ethical supply chain	-.493	-.117	.273	.094	.255	-.478	.228	.241
Customers health and safety practices	.419	.140	.336	.091	.146	.470	-.121	.133
Quest for certification	-.179	-.098	.361	-.060	.123	.335	.373	-.196
Patient safety	.280	.210	-.323	-.259	.556	-.070	-.028	.267
Employee well being	-.474	.442	.010	.419	.218	.167	-.171	-.149
Community health impact	-.031	.620	.048	.521	-.286	-.045	-.014	-.035
Sustainable design and materials	-.177	.502	.237	-.519	.039	-.012	-.229	.180
Transportation access	.329	.301	-.213	.210	.348	-.418	-.146	-.183
Biodiversity	-.312	.324	-.026	-.248	.524	.309	.212	-.042
Green spaces	.034	.364	-.509	.348	-.164	-.112	.147	.399
Resilience climate change	.631	-.175	.081	-.222	-.317	-.152	.214	.102

Extraction Method: Principal Component Analysis.
a. 8 components extracted.

Table 6: Rotated Component Matrix[a]

	Component							
	1	2	3	4	5	6	7	8
Energy efficiency								.776
Water conservation			.643					
Waste management								
Indoor air quality		.712						
Green certification								
Community engagement		.681						
Sustainable sourcing			.455					
Employment, health and safety practices								
Ethical supply chain					.749			
Customers health and safety practices			.709					
Quest for certification								
Patient safety							.769	
Employee well being	.834							
Community health impact				.541				
Sustainable design and materials		.504						
Transportation access						.586		
Biodiversity	.456						.555	
Green spaces				.813				
Resilience climate change								

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 13 iterations.

The rotated component matrix shows the factor loadings for each variable, eight components were extracted as factors influencing ESG for residential properties. The first component loaded two (2) factors which are: employee wellbeing and biodiversity. The second component loaded three (3) factors: indoor air quality, community engagement, sustainable design and materials. The third component loaded three (3) factors and they are: water conservation, sustainable sourcing, customer's health and safety practices. The fourth component loaded two (2) factors and they are: community health impact, green spacing. The fifth component loaded one (1) component; electrical supply chain. The sixth component loaded one (1); transportation

access. The seventh component loaded two (2); patient safety, biodiversity. The eight component loaded one (1); energy efficiency.

FACTORS INFLUENCING ESG FOR COMMERCIAL PROPERTIES

Table 7: Descriptive Statistics

	N	Mean	Rank
Employee well being	435	3.32	1st
Community health impact	435	3.23	2nd
Community engagement	435	3.22	3rd
Sustainable design and materials	435	3.19	4th
Indoor air quality	435	3.17	5th
Transportation access	435	3.15	6th
Energy efficiency	435	3.15	6th
Patient safety	435	3.12	7th
Green certification	435	3.11	8th
Waste management	435	3.06	9th
Water conservation	435	3.01	10th
Quest for certification	435	2.97	11th
Resilience climate change	435	2.93	12th
Biodiversity	435	2.92	13th
Sustainable sourcing	435	2.91	14th
Ethical supply chain	435	2.86	15th
Employment, health and safety practices	435	2.86	15th
Customers health and safety practices	435	2.83	16th
Green spaces	435	2.73	17th
Valid N (listwise)	435		

Source: Field survey, 2024

According to the information on table 7, employee well-being ranked 1st with 3.32, community health impact ranked 2nd with mean score of 3.23, community engagement ranked 3rd with mean score of 3.22, sustainable design and materials ranked 4th with mean score of 3.19, indoor air quality ranked 5th with mean score of 3.17, transportation access and energy efficiency ranked 6th with mean score of 3.15, patient safety ranked 7th with mean score of 3.12 while green certification ranked 8th with mean score of 3.11.

Table 8: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.797
Bartlett's Test of Sphericity	Approx. Chi-Square	1401.895
	Df	171
	Sig.	.000

Source: Field survey, 2024

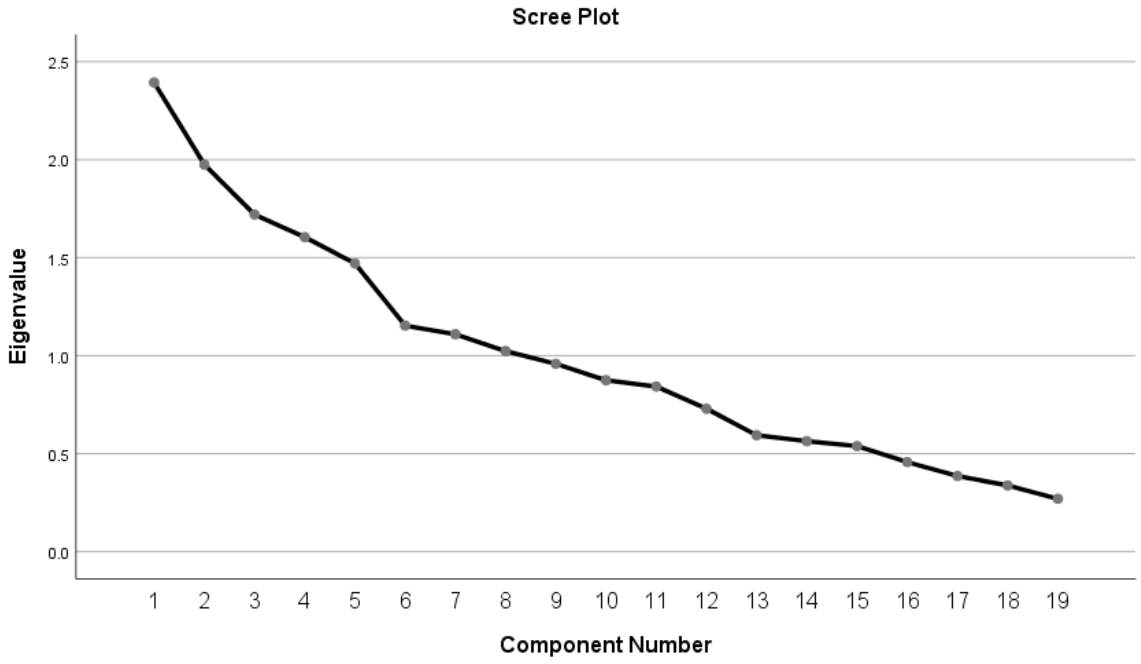
Kasier-Meyer-Olkin's measure of sampling adequacy and Barlett's Test of sphericity are presented in Table 8 above. KMO measure is performed to check the degree of inter-correlation among the items and the appropriateness of factor analysis. Kim and Mueller (1978) suggested that KMOs in the range of 0.5-0.7 are considered average, those in the range of 0.7-0.8 are considered good while those in 0.8-0.9 are great and values greater than 0.9 are superb. The table above shows that the KMO values obtained are in the range of 0.79 which indicates that the sample is good.

Table 9: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.393	12.596	12.596	2.393	12.596	12.596
2	1.975	10.395	22.991	1.975	10.395	22.991
3	1.720	9.052	32.042	1.720	9.052	32.042
4	1.605	8.445	40.487	1.605	8.445	40.487
5	1.470	7.739	48.227	1.470	7.739	48.227
6	1.153	6.070	54.296	1.153	6.070	54.296
7	1.109	5.836	60.133	1.109	5.836	60.133
8	1.023	5.384	65.516	1.023	5.384	65.516
9	.958	5.044	70.560			
10	.875	4.603	75.163			
11	.843	4.434	79.598			
12	.730	3.839	83.437			
13	.594	3.127	86.564			
14	.564	2.967	89.532			
15	.539	2.836	92.367			
16	.457	2.404	94.771			
17	.386	2.032	96.803			
18	.338	1.777	98.580			
19	.270	1.420	100.000			

Extraction Method: Principal Component Analysis.

Table 9 shows that Principal Component Analysis was conducted and eight components were extracted for the factors affecting ESG for commercial properties and it only retained those components whose variance is greater than 1.0. The factors revealed the presence of six axes with eigenvalues exceeding 1.0, explaining 12.596%, 10.395%, 9.052%, 8.445%, 7.737%, 6.070%, 5.836%, 5.384% of the total variance respectively and resulting with a cumulative variance of 65.576%. The principal factors influencing ESG for commercial properties are: Employee wellbeing, community health impact, community engagement, sustainable design and materials, indoor air quality, transportation access, energy efficiency, patient safety and green certification. It could be noted that while all other factors are related but they contributed in small measures as revealed by factor analysis.



The scree plot shows that after the first two components, the difference between the fourth and fifth eigenvalues increased and then gradually declined and became more or less than 2.0, approximately at 1.86 after component five. The first component explains 12.596% of the total variance at 2.393, the second component explains 10.395% of the total variance at 1.975, the third component explains 9.052% of the total variance at 1.605, the fourth component explains 8.445% of the total variance at 1.470, the fifth component explains 7.737% of the total variance at 1.304, The sixth component explains 6.070% of the total variance at 1.153, the seventh component explains 5.836% of the total variance at 1.109, the eight component explains 5.384% of the total variance at 1.023. Thus, the principal

factors influencing ESG for commercial properties are: Employee well-being, community health impact, community engagement, sustainable design and materials, indoor air quality, transportation access, energy efficiency, patient safety and green certification

Table 10: Component Matrix[a]

	Component							
	1	2	3	4	5	6	7	8
Energy efficiency	.219	.227	-.351	.054	.063	-.074	-.295	-.315
Water conservation	.190	.189	.386	-.021	.284	-.475	.298	-.447
Waste management	.131	.144	.748	.064	.080	.295	-.145	-.085
Indoor air quality	.078	-.076	-.343	.326	-.623	-.113	-.187	.071
Green certification	-.395	.190	-.142	.654	.000	-.234	-.159	-.206
Community engagement	.470	.051	.175	.423	-.066	-.403	-.067	.359
Sustainable sourcing	.320	-.139	.085	.387	-.194	.197	.535	-.149
Employment, health and safety practices	.213	.441	.018	-.162	-.434	.115	.158	-.226
Ethical supply chain	-.210	-.448	.050	-.113	.190	-.182	.402	.360
Customers health and safety practices	.554	.013	.005	.195	.301	.370	-.102	-.105
Quest for certification	-.161	-.497	.279	.271	.190	.059	-.275	.086
Patient safety	.365	.229	-.589	-.031	.368	.138	.099	.148
Employee well being	-.597	.218	-.141	.129	.420	.349	-.084	-.032
Community health impact	-.320	.512	.403	-.019	-.028	-.166	-.279	.213
Sustainable design and materials	-.117	.116	.021	.748	.156	.143	.268	.052
Transportation access	.135	.616	.239	-.019	-.214	.236	.104	.320
Biodiversity	-.621	.065	-.028	.040	-.346	.249	.216	.064
Green spaces	.012	.611	-.203	-.018	.310	-.217	.157	.289
Resilience climate change	.612	-.172	.050	.061	-.007	.162	-.202	.240

Extraction Method: Principal Component Analysis.
a. 8 components extracted.

The table revealed the component matrix for the factors and 8 component factors were loaded.

Table 11: Rotated Component Matrix[a]

	Component							
	1	2	3	4	5	6	7	8
Energy efficiency						-		.604
Water conservation							.883	
Waste management	.456	.474						
Indoor air quality								
Green certification						.616		
Community engagement			.776					
Sustainable sourcing						.467		
Employment, health and safety practices				.711				
Ethical supply chain								
Customers health and safety practices	.720							
Quest for certification								
Patient safety					.724			
Employee well being								
Community health impact		.792						
Sustainable design and materials						.828		
Transportation access		.514		.551				
Biodiversity							-	
Green spaces					.715			
Resilience climate change	.575							

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 16 iterations.

The rotated component matrix shows the factor loadings for each variable, eight components were extracted as factors influencing ESG for commercial properties. The first component loaded three (3) factors which are: waste management, customer's health and safety practices, resilience climate change. The second component loaded three (3) factors: waste management, community health impacts, transportation access. The third component loaded one (1) factor; community engagement. The fourth component loaded three (3) factors and they are: employment, health and safety practices and transportation access. The fifth component loaded two (2) factors; patient health, green spacing. The sixth component loaded two (2); green certification, sustainable sourcing, sustainable design and materials. The seventh component loaded one (1); waste management. The eight component loaded one (1); energy efficiency.

SUMMARY OF FINDINGS AND CONCLUSION

The principal factors identified after the principled component analysis has been done which influences ESG in residential property include; employee wellbeing, community engagement, transportation access, biodiversity, energy efficiency, indoor air quality, waste management and green certification. Of all the identified factors, employee wellbeing was ranked first followed by community engagement while green spaces were ranked the seventeenth. The measure of sampling adequacy and sphericity done shows that samples used were good in cases.

The principal factors identified after the principled component analysis has been done which influences ESG in commercial property include; Employee well-being, community health impact, community engagement, sustainable design and materials, indoor air quality, transportation access, energy efficiency, patient safety and green certification. Of all the identified factors, employee wellbeing was ranked first followed by community health impact, in this case community engagement ranked third as opposed to second it ranked in that of residential while green spaces was ranked seventeenth. Also, the measure of sampling adequacy and sphericity done shows that samples used were good in cases.

Conclusively, the real estate sector no doubt plays a vital role in the global community and economic activity. Its role in shaping the future of our planet is one without doubt. Due to the increasing need to look at the ESG factors in the real investment decision, this study identified the environmental, social and governance (ESG) factors as key factors in residential and commercial properties/real estate investment decision.

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