Study of End-User Willingness to Pay for Sustainable House in Gresik Regency

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ABSTRACT

Gresik is a preferred residential location due to available land and affordable prices, thus demand for land-housing in Gresik may increase yearly. This study aims to determine the willingness-to-pay (WTP) of end-users for sustainable residential buildings in Gresik, using a statistical approach to obtain a comprehensive picture of the property market situation. Both of qualitative and quantitative approaches used to gain information and data collection through questionnaires. The results revealed that social, environmental, infrastructure, technological, and governmental variables have a significant positive effect on willingness to pay, while the economic variable showed no significant influence. This indicates that while affordability remains a practical concern, the decision to invest in sustainable housing is more strongly driven by non-economic factors related to comfort, quality, and long-term value. Social aspects, such as safety, community engagement, and inclusivity, play a major role in shaping consumer preferences, reflecting the importance of social cohesion in sustainable living environments.

Keywords: willingness to pay, sustainable house, residential, market analysis, property.

INTRODUCTION

Gresik has a substantial increase in its population, from 1,332,664 in 2023 to 1,350,380 in 2024, representing a growth rate of 0.66%. The region's status as a buffer zone for Surabaya City has resulted in a migration of residents to peri-urban areas [1]. Thus, Gresik has become a favored location for residential development due to the availability of land and affordable prices. According to propertyandthecity.com, Surabaya property market continues to expand into surrounding areas, particularly westward toward Gresik, including regions such as Kebomas, Cerme, Menganti, and Driyorejo. Furthermore, the emergence of new industrial centers, including the Java Integrated Industrial and Ports Estate (JIIPE), has bolstered the influx of migrants to Gresik and increase steadily in the coming years.

Housing is recognized as a primary necessity for individuals, providing essential spaces for daily activities and serving as a dominant component of residential areas [2], [3]. The residential sector is viewed as a public construct that significantly influences urban development and contributes to the attainment of sustainability. Sustainable residential areas are designed and operated with the aim of reducing carbon footprints and minimizing other environmental impacts. Therefore, the development of residential areas adhering to sustainability principles is essential moving forward. Typically, residential areas that integrate sustainability while addressing environmental, social, economic etc considerations tend to command higher property values. Each element that enhances the value of a residence directly contributes to the willingness to pay for that property [4].

WTP pertains to the maximum amount an individual is willing to invest in a specific product [5]. This maximum price significantly influences consumer behavior regarding their product choices. WTP serves as an indicator of a customer's purchasing power concerning the offered goods. When a buyer expresses a readiness to pay the highest price for a sustainable product and subsequently becomes a resident or end-user of the property, they assume a pivotal role in facilitating the attainment of future sustainability objectives through the stewardship of their residence. When it comes to purchasing a home, buyers typically have two primary motivations: (1) to reside in the

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property themselves, thereby acting as the end-user, or (2) to acquire the property for investment purposes. A significant majority of consumers acquire homes in Gresik for personal purposes. Furthermore, Bank Indonesia has documented a 7.8% growth in property credit in 2024, highlighting a pronounced demand within the property sector. Consequently, the property market has emerged as one of the principal drivers of national economic growth.

Pranoto and Anastasia [4] previously undertook a study examining the preference for housing located in proximity to toll road access, which may impact buyers' willingness to pay additional amounts. The findings indicated that factors such as physical conditions, location, and planning concepts exert a significant influence on this willingness. In a separate investigation, Mandel [6] assessed the willingness to pay for sustainable housing, focusing particularly on attributes related to environmental sustainability, and identified a positive correlation.

This forthcoming research aims to adopt a more comprehensive approach by evaluating various dimensions of sustainability beyond environmental considerations alone. It will encompass social, economic, governmental, technological, and infrastructural aspects, all of which are critical pillars for the successful attainment of sustainability in the future.

This study endeavors to evaluate the willingness to pay among buyers (end-users) for residential buildings designed in accordance with sustainable principles in Gresik Regency. Employing a statistical approach, the research aims to provide a comprehensive analysis of the current dynamics within the property market, particularly concerning residential properties in Gresik.

RESEARCH METHODS

The research consists several steps such as variable identification, research model hypothesis, main survey and data analysis.

Step 1: Variable identification.

This step was intended to investigate research variables from previous studies which can be seen in Table 1. The variables that were successfully collected consisted of 5 (five) economic variables, 5 (five) social variables, 8 (eight) environtment variables, 9 (nine) infrastructure variables, 3 (three) technology variables, 8 (eight) government variables and 3 (three) willingness-to-pay variables.

Table 1. List of variables and its operational definition

Code	Variable	Operational Definition	Source
ECO1	Price	The housing unit is offered at an affordable price, inclusive of installments and interest, making it accessible to prospective buyers	
ECO2	Investment Value	A strategic location enhances the property's investment value.	
ECO3	Job opportunities for local residents	Residential areas can provide employment for local residents, such as security guards, cleaners, or domestic helpers	[3], [4], [15]–[22], [7]–[14]
ECO4	Sub-Urban Farming	The houses offered have open land that can be used for small-scale farming, this is to support food security for urban households	
ECO5	Cost of Living	The amount of operational expenses and living costs for end-users living in Gresik	
SOS1	Social Connection	Residents regularly participate in community activities, including worship, social gatherings, group sports, and community service.	

Code	Variable	Operational Definition	Source
SOS2	Adoption of Local Cultural Values	Residential areas remain open to the local community and actively value local culture.	
SOS3	Security	A safe environment and the availability of a 24-hour security post in the residential area.	
SOS4	Friendliness	Residents live in harmony without discrimination based on race, ethnicity, or religion.	
SOS5	Coordination within the residential community	Coordination of the local community through regular direct and indirect meetings.	
ENV1	Quality of Green Open Spaces	Adequate provision of green open spaces such as public parks, recreational areas, and sports facilities that support community well-being and environmental sustainability.	
ENV2	Noise Pollution Control	Minimal exposure to noise pollution originating from vehicular traffic and other urban activities, ensuring a comfortable and healthy living environment.	
ENV3	Environmentally Friendly Building Materials	Demonstrated commitment by residential developers to utilize sustainable and environmentally friendly construction materials throughout the building process.	
ENV4	Efficient Groundwater Utilization	Responsible consumption of groundwater to meet household needs, accompanied by residents' awareness and practices promoting water-use efficiency.	
ENV5	Water Quality	Reliable access to clean and safe water in sufficient quantity to meet the daily needs of residents.	
ENV6	Air Quality	Maintenance of clean and healthy air conditions within residential areas, free from excessive pollutants and emissions.	
ENV7	Flood Resilience	Residential areas are designed and maintained to be flood-free, ensuring safety and continuity of daily activities.	
ENV8	Traffic and Mobility Conditions	Road networks surrounding the residential complex are free from congestion	
INF1	Accessibility to Public Facilities	Strategic location ensuring close proximity between residential areas and essential public facilities	
INF2	Resilient and Adaptive Building Design	Implementation of housing design and construction practices that comply with disaster-resistant planning standards, including structural resilience against earthquakes and other natural hazards.	

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Code	Variable	Operational Definition	Source
INF3	Aesthetic Residential Environment	Provision of scenic and visually appealing residential surroundings that enhance residents' comfort and overall quality of life.	
INF4	Accessibility and Inclusivity for Persons with Disabilities	Availability of inclusive infrastructure and facilities designed to support the mobility and daily activities of persons with disabilities.	
INF5	Access to Public Transportation	Sufficient availability of public transportation routes passing through or located near residential areas, providing convenient and affordable mobility options for residents.	
INF6	Availability of Supporting Facilities	Inclusion of complementary amenities such as clubhouses, golf courses, playgrounds, theme parks, and other recreational or community facilities that support residents' well-being and social interaction.	
INF7	Effective Drainage System	Implementation of a well-designed and well-maintained drainage system, including the provision of temporary rainwater storage or retention facilities to prevent waterlogging and flooding.	
INF8	Integration with Waste Management Systems	Availability of integrated community-based waste management initiatives, such as waste banks for sorting and recycling organic and non-organic waste.	
INF9	Residential Road Infrastructure	Availability of road networks within residential areas that are well-designed, adequately maintained, and compliant with safety and design standards, including appropriate traffic-calming measures (e.g., speed bumps).	
TEC1	Internet Conection	Availability of internet connection and good network quality.	
TEC2	Intra and Inter-resident Social Media Groups	Residents are connected to social media groups such as WhatsApp, Line, etc.	
TEC 3	CCTV	The housing area is equipped with CCTV cameras.	
TEC4	Application of energy-efficient technology	Use of energy-efficient technology (e.g., lighting, green roofs/walls, solar panels, etc.).	
GOV1	Price Subsidies	The government provides financial assistance and price subsidies to encourage the development and accessibility of sustainable housing.	
GOV2	Streamlined Administration	Administrative and licensing procedures are designed to be simple, efficient, and transparent, ensuring a fast process free from illegal levies.	

Code	Variable	Operational Definition	Source
GOV3	Transparency	Local governments ensure that information related to sustainable housing programs and policies is open and easily accessible to the public.	
GOV4	Supportive Local Policies	Local government policies are formulated to promote and facilitate the growth of sustainable residential developments.	
GOV7	Sustainability Certification	Official certification systems are established for developers who adopt sustainable housing principles in their projects.	
GOV8	Developer Incentives	The government provides targeted incentives to encourage developers to invest in and produce environmentally sustainable housing projects.	
WTP1	Purchase Willingness	The level of willingness to pay for a sustainable home, excluding ongoing operational or maintenance costs.	
WTP2	Rental Willingness	The willingness to pay rent for sustainable housing units.	
WTP3	Additional Cost Willingness	Willingness to pay additional costs to build housing facilities if they already own a home in the residential area	

Step 2: Research model hypothesis.

Next, from the results of the literature review, a research model and hypothesis are compiled which can be seen in Figure 1. The hypotheses for this study are as follows:

H1: Economic has a positive effect on the willingness-to-pay sustainable house
H2: Social has a positive effect on the willingness-to-pay sustainable house
H3: Environment has a positive effect on the willingness-to-pay sustainable house
H4: Infrastructure has a positive effect on the willingness-to-pay sustainable house
H5: Technology has a positive effect on the willingness-to-pay sustainable house
H6: Government has a positive effect on the willingness-to-pay sustainable house

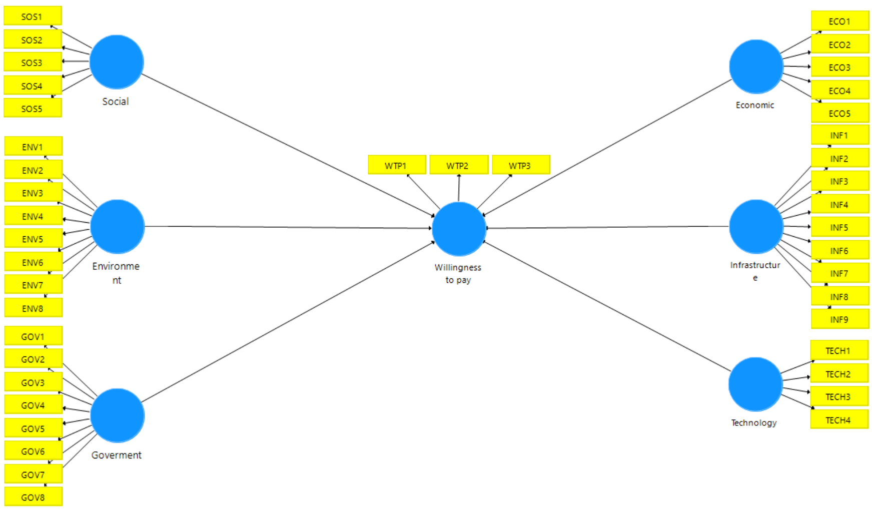

Figure 1. Research model

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Step 3: Development of the Questionnaire and Main Survey

The questionnaire was designed utilizing a Likert scale ranging from 1 to 5 and was distributed to research participants through both face-to-face interactions and email correspondence. Data collection occurred over a duration of four weeks. The participants in this study were end-user of land-housing in Gresik. The sampling method employed for this research was snowball sampling. As the study utilized structural equation modeling (SEM), the number of respondents was determined in accordance with the guidelines proposed by Hair et al. [23], [24], which recommend a sample size of five times the number of research indicators. With a total of 39 indicators incorporated in this study, the minimum required number of respondents was established at 195. In total, 300 completed questionnaires were collected, comprising responses from end-user sustainable house, consisting of : 60% female and 40% male; 10,67% of higschool degree, 75,3% of bachelor degree and 14% of master degree; 38,7% has salary around < 5 million rupiah, 36,7% has salary around 5 million rupiah – 10 million rupiah and 23,3 has salary around > 10 million; 19,3% is government employee, 38% is private sector employee, 28,7% is entrepreneur, and 14% has other job.

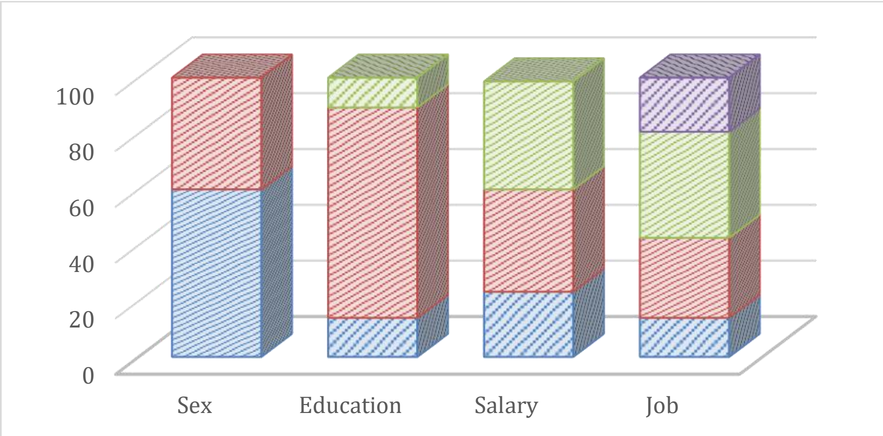

Figure 2. Respondent demography

Step 4: Data Analysis Using Structural Equation Modeling (SEM)

The objective of the analysis was to validate the hypothetical model formulated at the outset of the study. Prior to this analysis, a goodness-of-fit test was conducted on the indicators associated with each variable through the application of confirmatory factor analysis (CFA). The analysis was performed using SmartPLS 3.0 software.

RESULT AND DISCUSSION

The initial validity test involves two main approaches: the loading factor value and the Average Variance Extracted (AVE) value. The loading factor indicates the strength of the correlation between each measurement item (indicator) and its corresponding latent variable (construct). An indicator is considered to demonstrate adequate convergent validity if the loading factor for each path between the latent variable and its indicator exceeds 0.7.

Based on the loading factor calculations, it was found that the latent variables for government and infrastructure had indicators with loading factor values lower than 0.7, which are GOV2, GOV4, INF8, and INF9 thus can be eliminated from further analysis. Table 1 shows the loading factor values after correction.

Table 2. Corrected Loading Factor

Code	*Loading Factor Value*	Explanation	Code	*Loading Factor Value*	Explanation
ECO1	0,847	Valid	INF1	0,771	Valid

Code	*Loading Factor Value*	Explanation	Code	*Loading Factor Value*	Explanation
ECO2	0,914	Valid	INF2	0,790	Valid
ECO3	0,939	Valid	INF3	0,775	Valid
ECO4	0,878	Valid	INF4	0,811	Valid
ECO5	0,784	Valid	INF5	0,774	Valid
ENV1	0,788	Valid	INF6	0,729	Valid
ENV2	0,839	Valid	INF7	0,830	Valid
ENV3	0,818	Valid	SOS1	0,775	Valid
ENV4	0,789	Valid	SOS2	0,810	Valid
ENV5	0,722	Valid	SOS3	0,843	Valid
ENV6	0,803	Valid	SOS4	0,824	Valid
ENV7	0,810	Valid	SOS5	0,807	Valid
ENV8	0,840	Valid	TECH1	0,701	Valid
GOV1	0,756	Valid	TECH2	0,729	Valid
GOV3	0,849	Valid	TECH3	0,872	Valid
GOV5	0,775	Valid	TECH4	0,762	Valid
GOV6	0,912	Valid	WTP1	0,948	Valid
GOV7	0,841	Valid	WTP2	0,952	Valid
GOV8	0,932	Valid	WTP3	0,924	Valid

The second approach to assessing convergent validity involves calculating the Average Variance Extracted (AVE). Based on the AVE results in Table 3, all AVE values are > 0.5, meaning all latent variables have absorbed > 50% of the variance from their respective indicators. AVE > 0.5 means that the latent or structural variable has absorbed more than 50% of the information in its indicator.

Table 3. Average Variance Extracted (AVE)

	Average Variance Extracted (AVE)
Economic	0,764
Environment	0,643
Goverment	0,717
Infrastructure	0,614
Social	0,659
Technology	0,591
Willingness to pay	0,886

In the cross-loading test, the loading values of each indicator with its corresponding latent variable are compared to the loading values of the same indicator with other latent variables. Ideally, the loading value of an indicator should be higher for its associated latent variable than for any other latent variable. Based on the results presented in the Table 4, it can be concluded that this study demonstrates good discriminant validity. Based on the analysis using the Fonell-Larcker method in Table 5, the root mean squared variance extracted (AVE) value for each latent variable was higher than that for the other latent variables. Therefore, this research model can be said to have good discriminant validity.

Table 4. Cross-Loading Test

Code	Economic	Environment	Goverment	Infrastructure	Social	Technology	Willingness to pay
ECO1	**0,847**	0,578	0,015	0,353	0,222	0,068	0,160
ECO2	**0,914**	0,673	0,059	0,385	0,266	0,125	0,186
ECO3	**0,939**	0,671	0,062	0,410	0,309	0,151	0,171

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Code	Economic	Environment	Goverment	Infrastructure	Social	Technology	Willingness to pay
ECO4	**0,878**	0,615	0,051	0,342	0,322	0,186	0,163
ECO5	**0,784**	0,567	0,055	0,310	0,383	0,299	0,119
ENV1	0,619	**0,788**	-0,025	0,440	0,362	0,112	0,134
ENV2	0,687	**0,839**	0,016	0,468	0,347	0,083	0,190
ENV3	0,778	**0,818**	0,019	0,450	0,351	0,052	0,156
ENV4	0,552	**0,789**	0,090	0,382	0,380	0,160	0,166
ENV5	0,474	**0,722**	0,089	0,438	0,387	0,120	0,121
ENV6	0,479	**0,803**	0,002	0,467	0,589	0,106	0,085
ENV7	0,494	**0,810**	0,021	0,472	0,576	0,191	0,132
ENV8	0,444	**0,840**	0,020	0,552	0,641	0,142	0,197
GOV1	0,009	0,032	**0,756**	-0,043	-0,007	-0,023	0,048
GOV3	0,013	0,004	**0,849**	0,002	-0,046	-0,044	0,097
GOV5	0,016	0,027	**0,775**	-0,027	-0,039	-0,081	-0,002
GOV6	0,044	0,034	**0,912**	-0,005	-0,054	-0,040	0,099
GOV7	0,033	0,030	**0,841**	-0,006	-0,024	0,011	0,030
GOV8	0,092	0,052	**0,932**	-0,009	-0,042	-0,034	0,144
INF1	0,378	0,495	-0,077	**0,771**	0,508	0,184	0,137
INF2	0,458	0,538	0,003	**0,790**	0,439	0,174	0,227
INF3	0,283	0,393	0,017	**0,775**	0,455	0,192	0,138
INF4	0,321	0,466	0,020	**0,811**	0,542	0,194	0,219
INF5	0,248	0,384	0,016	**0,774**	0,548	0,224	0,108
INF6	0,242	0,395	-0,004	**0,729**	0,467	0,231	0,083
INF7	0,265	0,420	-0,036	**0,830**	0,574	0,263	0,206
SOS1	0,358	0,485	-0,015	0,521	**0,775**	0,314	0,065
SOS2	0,285	0,403	-0,075	0,467	**0,810**	0,510	0,164
SOS3	0,239	0,537	-0,033	0,558	**0,843**	0,340	0,177
SOS4	0,257	0,419	-0,020	0,489	**0,824**	0,297	0,125
SOS5	0,284	0,435	-0,024	0,592	**0,807**	0,328	0,117
TECH1	0,258	0,158	0,054	0,243	0,260	**0,701**	0,097
TECH2	0,201	0,158	-0,020	0,200	0,375	**0,729**	0,020
TECH3	0,060	0,085	-0,050	0,183	0,387	**0,872**	0,144
TECH4	0,131	0,119	-0,085	0,205	0,406	**0,762**	0,094
WTP1	0,169	0,185	0,111	0,233	0,183	0,149	**0,948**
WTP2	0,212	0,220	0,106	0,238	0,181	0,129	**0,952**
WTP3	0,131	0,127	0,118	0,145	0,111	0,118	**0,924**

Table 5. Fornell-Larcker Test

	Economic	Environment	Goverment	Infrastructure	Social	Technology	Willingness to pay
Economic	**0,874**						
Environment	0,712	**0,802**					
Goverment	0,055	0,037	**0,847**				
Infrastructure	0,414	0,573	-0,010	**0,784**			
Social	0,336	0,559	-0,046	0,641	**0,812**		

	Economic	Environment	Goverment	Infrastructure	Social	Technology	Willingness to pay
Technology	0,179	0,149	-0,037	0,262	0,453	**0,769**	
Willingness to pay	0,185	0,194	0,118	0,224	0,173	0,141	**0,941**

The next analysis is to measure the reliability of the structural model using the composite reliability and Cronbach's alpha approaches. The purpose of this reliability measurement is to determine the internal consistency of the research model's measurements. It is expected that if the research model has measurement consistency, it can be interpreted as an indicator can consistently measure a variable. A construct is said to have good reliability if its Cronbach's alpha and composite reliability measurement values are > 0.70 (Hair et al., 2014). Based on the calculation results shown in the Table 6, it is known that the Cronbach's alpha and composite reliability values for all latent variables have reached >0.7, so it can be said that this research model has good reliability where each indicator can consistently measure its respective variables.

Table 6. Cronbach's alpha and composite reliability

	Cronbach's Alpha	Composite Reliability
Economic	0,922	0,942
Environment	0,921	0,935
Goverment	0,931	0,938
Infrastructure	0,898	0,917
Social	0,875	0,906
Technology	0,789	0,852
Willingness to pay	0,936	0,959

The next step was to test the hypothesis by estimating the path coefficients. The path coefficient estimate shows the value that describes how latent variables are related, based on the bootstrapping method. A measurement is considered statistically significant if the t-statistic is higher than 1.64 (one-tailed) and the p-value is lower than 0.05 at the 5% significance level. The parameter coefficient shows the direction of influence, indicating whether the relationship is positive or negative, and also tells how strongly the independent variable affects the dependent variable.

Table 7. A path coefficient table to view the t-statistic value.

	T Statistics	P Values	Explanation
Economic -> Willingness to pay	0,896	0,371	Insignificant
Environment -> Willingness to pay	1,775	0,035	Significant
Goverment -> Willingness to pay	2,500	0,004	Significant
Infrastructure -> Willingness to pay	2,309	0,021	Significant
Social -> Willingness to pay	3,709	0,000	Significant
Technology -> Willingness to pay	11,827	0,005	Significant

Based on the results in Table 6, the following research hypotheses can be proven:

1. H1: Economic has a positive effect on the willingness-to-pay sustainable house
   Based on the test results, the economic variable have no positive effect on willingness to pay. This is evidenced by the T-statistic value of 0.896, which is lower than the critical value of 1.64, and a P-value of 0.371, which exceeds the 0.05 significance level.
   According to a study conducted by Mironiuc et al [25], cost factors (such as construction expenses for sustainable house) have a positive impact on property value increase. These costs include investments in energy-efficient features such as LED lighting and solar panels. However, the higher price of sustainable house tends to reduce buyers' willingness to pay, despite the substantial benefits perceived by end-users.

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2. H2: Social has a positive effect on the willingness-to-pay sustainable house
   Based on the test results, social variables have a positive effect on willingness to pay. This is evident from the T-statistic of 3.709, which is greater than 1.64. The P-value of 0.000 is less than 0.05, indicating a significant effect.
   The value of a residential property is highly dependent on the quality of its surrounding community. Purchasers are willing to offer a higher price for homes situated in neighborhoods that exhibit strong social sustainability, evidenced by factors like low crime statistics, superior school systems, and favorable proximity to amenities [13].
3. H3: Environment has a positive effect on the willingness-to-pay sustainable house
   Based on the test results, environment variables have a positive effect on willingness to pay. This is evident from the T-statistic of 1.775, which is greater than 1.64. The P-value of 0.035 is less than 0.05, indicating a significant effect.
   Environmentally friendly building features like proper ventilation and the use of low-toxic materials contribute to a healthier indoor environment, boosting a home's value. The value is further enhanced by a property's location near green spaces and nature, which appeals to buyers seeking a better quality of life and a connection to the outdoors [4], [7].
4. H4: Infrastructure has a positive effect on the willingness-to-pay sustainable house
   Based on the test results, infrastructure variables have a positive effect on willingness to pay. This is evident from the T-statistic of 2.309, which is greater than 1.64. The P-value of 0.021 is less than 0.05, indicating a significant effect.
   Improved accessibility and inclusivity in public facilities for individuals with disabilities can exert a positive influence on housing prices by increasing the demand for accessible residential properties situated near transportation hubs. The availability of barrier-free and inclusive facility enables a wider population segment, particularly individuals with disabilities, to participate more fully in economic, social, and community activities. As a result, enhanced mobility and connectivity contribute to a greater willingness to pay for housing that provides convenient access to such inclusive facilities [26].
5. H5: Technology has a positive effect on the willingness-to-pay sustainable house
   Based on the test results, technology variables have a positive effect on willingness to pay. This is evident from the T-statistic of 11.827, which is greater than 1.64. The P-value of 0.005 is less than 0.05, indicating a significant effect.
   Investing in innovative technologies and developing smart solutions that integrate sustainability and human well-being has become an increasingly urgent priority. As technological advancements continue to accelerate, more sophisticated devices, interfaces, and applications are emerging, simplifying daily life. In this context, sustainable technologies represent a valuable approach to addressing environmental challenges. Given that the residential sector contributes roughly one-fifth of global energy consumption, introducing technological innovations and formulating supportive energy policies—such as financial incentives or rebate programs—can encourage households to adopt sustainable technologies. This, in turn, can significantly lower energy use derived from non-renewable sources [27].
6. H6: Government has a positive effect on the willingness-to-pay sustainable house
   Based on the test results, it was found that economic variables did not have a positive effect on willingness to pay. This is evident from the T-statistic value of 1.327, which is smaller than 1.64. The P-value of 0.185 is greater than 0.05, indicating an insignificant effect. Nketiah et al (2022) shows that active government engagement and public education have a positive influence on individuals' attitudes and subjective norms, thereby increasing their willingness to pay. Moreover, well-designed government policies and initiatives play a vital role in promoting green energy development and investment, ultimately fostering greater public acceptance and willingness to support such initiatives financially [28].

CONCLUSION

This study aimed to analyze the end-users' willingness to pay (WTP) for sustainable housing in Gresik Regency by evaluating six key variables economic, social, environmental, infrastructure, technological, and governmental factors using the Structural Equation Modeling (SEM) approach. The findings provide a comprehensive understanding of the determinants influencing public interest in sustainable residential development. The results revealed that social, environmental, infrastructure, technological, and governmental variables have a significant positive effect on willingness to pay, while the economic variable showed no significant influence. This indicates that while affordability remains a practical concern, the decision to invest in sustainable housing is more strongly driven by non-economic factors related to comfort, quality, and long-term value. Social aspects, such as safety, community engagement, and inclusivity, play a major role in shaping consumer preferences, reflecting the importance of social cohesion in sustainable living environments. Environmental factors also significantly contribute to WTP, emphasizing that green spaces, clean air, and environmentally friendly building materials enhance perceived residential value. Infrastructure variables, including accessibility, disaster-resilient design, and inclusive facilities, positively influence WTP by ensuring convenience and safety for diverse community groups. Furthermore, technological advancements such as energy-efficient systems, smart devices, and connectivity are key motivators for residents seeking modern, sustainable lifestyles. Among all, technology demonstrated the strongest statistical impact, highlighting its central role in the transition toward sustainable urban living. Governmental support and policy frameworks also play a critical role in shaping positive public attitudes and acceptance of sustainable housing. Transparent regulations, administrative efficiency, and incentives for developers were found to foster trust and increase residents' willingness to invest. This underlines the importance of active government involvement in education, promotion, and implementation of sustainability policies. In conclusion, this research demonstrates that the willingness to pay for sustainable housing in Gresik is influenced more by social, technological, environmental, and institutional dimensions than by purely economic considerations. The study contributes novelty by integrating multidisciplinary sustainability indicators into housing market analysis, offering valuable insights for policymakers, developers, and urban planners in promoting sustainable and inclusive residential development in emerging urban regions.

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REFERENCES

[1] H. E. Ardiansyah and D. Rahmawati, "Efektivitas Penyediaan Perumahan oleh Perumnas dalam Menangani Masalah Housing Backlog di Kabupaten Gresik," *J. Tek. ITS*, vol. 10, no. 1, pp. C1–C6, 2021.

[2] J. Węgrzyn and K. Kania, "Heterogeneous preferences for sustainable housing: evidence from Poland," *J. Hous. Built Environ.*, vol. 39, no. 2, pp. 749–767, 2024, doi: 10.1007/s10901-023-10101-6.

[3] P. Yandri, D. S. Priyarsono, A. Fauzi, and A. H. Dharmawan, "Formulating and Validating Sustainable Residential Area Indicators in Suburban Metropolitan Jakarta," *Int. Rev. Spat. Plan. Sustain. Dev.*, vol. 9, no. 3, pp. 82–102, 2021, doi: 10.14246/irspsd.9.3_82.

[4] V. W. Pranoto and A. Njo, "Effect of Residential Preferences on the Willingness to Pay for Residential with Near Toll Road Gate in Surabaya," *Dimens. Utama Tek. Sipil*, vol. 7, no. 1, pp. 33–46, 2020, doi: 10.9744/duts.7.1.33-46.

[5] S. Mishi and R. Mwanyepedza, "Willingness to accept and willingness to pay for residential properties: a hedonic model approach," *Emerald Open Res.*, vol. 1, no. 5, Jan. 2023, doi: 10.1108/EOR-05-2023-0012.

[6] S. Mandell and M. Wilhelmsson, "Willingness to Pay for Sustainable Housing," *Swedish Natl. Road Transp. Res. Inst. (VTI), Work. Pap.*, vol. 20, Jan. 2010, doi: 10.1080/10835547.2011.12092034.

[7] A. Zalejska-Jonsson, S. J. Wilkinson, and R. Wahlund, "Willingness to pay for green infrastructure in residential development-a consumer perspective," *Atmosphere (Basel).*, vol. 11, no. 2, pp. 1–20, 2020, doi: 10.3390/atmos11020152.

[8] A. W. Hapsariniaty, B. D. Sidi, and A. Nurdini, "Comparative Analysis of Choosing to Live in Gated Communities: A Case Study of Bandung Metropolitan Area," *Procedia - Soc. Behav. Sci.*, vol. 101, pp. 394–403, 2013, doi: 10.1016/j.sbspro.2013.07.213.

[9] J. Qusen Zumaya and J. Baqir Motlak, "Sustainable Housing Indicators and Improving the Quality of Life: The Case of Two Residential Areas in Baghdad City," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 754, no. 1, 2021, doi: 10.1088/1755-1315/754/1/012002.

[10] E. Mulliner, N. Malys, and V. Maliene, "Comparative analysis of MCDM methods for the assessment of sustainable housing affordability," *Omega (United Kingdom)*, vol. 59, pp. 146–156, 2016, doi: 10.1016/j.omega.2015.05.013.

[11] L. H. Le, A. D. Ta, and H. Q. Dang, "Building up a system of indicators to measure social housing quality in Vietnam," *Procedia Eng.*, vol. 142, pp. 116–123, 2016, doi: 10.1016/j.proeng.2016.02.021.

[12] H. N. Abushaqra and F. A. Al Khalifa, "Assessing Social Sustainability Indicators in New Housing Development: Case of New East Al Hidd Bahrain," *IET Conf. Proc.*, vol. 2023, no. 44, pp. 288–293, 2023, doi: 10.1049/icp.2024.0940.

[13] E. Saptutyningsih and Nursetiawan, "Willingness to pay for flood risk mitigation among residents living near river's confluence in Yogyakarta, Indonesia," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 1314, no. 1, 2024, doi: 10.1088/1755-1315/1314/1/012061.

[14] A. Renald, P. Tjiptoherijanto, E. Suganda, and R. D. Djakapermana, "Toward Resilient and Sustainable City Adaptation Model for Flood Disaster Prone City: Case Study of Jakarta Capital Region," *Procedia - Soc. Behav. Sci.*, vol. 227, no. November 2015, pp. 334–340, 2016, doi: 10.1016/j.sbspro.2016.06.079.

[15] L. Pérez-Sánchez, R. Velasco-Fernández, and M. Giampietro, "Factors and actions for the sustainability of the residential sector. The nexus of energy, materials, space, and time use," *Renew. Sustain. Energy Rev.*, vol. 161, no. June, p. 112388, 2022, doi: 10.1016/j.rser.2022.112388.

[16] T. Holler and A. Serra, "A vision of suburban sustainability: The Long Island Radically Rezoned project," *Metrop. Sustain. Underst. Improv. Urban Environ.*, pp. 697–720, 2012, doi: 10.1533/9780857096463.6.697.

[17] W. Rid, J. Lammers, and S. Zimmermann, "Analysing sustainability certification systems in the German housing sector from a theory of social institutions," *Ecol. Indic.*, vol. 76, pp. 97–110, 2017, doi: 10.1016/j.ecolind.2016.12.022.

[18] R. F. Aziz, "Ranking of delay factors in construction projects after Egyptian revolution," *Alexandria Eng. J.*, vol. 52, no. 3, pp. 387–406, 2013, doi: 10.1016/j.aej.2013.03.002.

[19] V. W. Y. Tam and S. X. Zeng, "Sustainable Performance Indicators for Australian Residential Buildings," *J. Leg. Aff. Disput. Resolut. Eng. Constr.*, vol. 5, no. 4, pp. 168–179, 2013, doi: 10.1061/(asce)la.1943-4170.0000123.

[20] C. Turcu, "Re-thinking sustainability indicators: local perspectives of urban sustainability," *J. Environ. Plan. Manag.*, vol. 56, no. 5, pp. 695–719, 2013, [Online]. Available: http://dx.doi.org/10.1080/09640568.2012.698984

[21] Z. S. Shama and J. B. Motlak, "Indicators for Sustainable housing," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 518, no. 2, 2019, doi: 10.1088/1757-899X/518/2/022009.

[22] M. A. Adabre and A. P. C. Chan, "Critical success factors (CSFs) for sustainable affordable housing," *Build. Environ.*, vol. 156, no. February, pp. 203–214, 2019, doi: 10.1016/j.buildenv.2019.04.030.

[23] J. F. Hair, B. J. Babin, W. C. Black, and R. E. Anderson, *Multivariate Data Analysis*. Cengage, 2019. [Online]. Available: https://books.google.co.id/books?id=0R9ZswEACAAJ

[24] A. G. Prafitasiwi, M. Rochim, and A. A. Permadi, "PENGARUH KOMUNIKASI STAKEHOLDER TERHADAP KEBERHASILAN PROYEK BANGUNAN PABRIK DI GRESIK," in *Prosiding Seminar Nasional Teknik Sipil*, 2024, vol. 2, no. 1, pp. 384–394.

[25] M. Mironiuc, E. Ionașcu, M. C. Huian, and A. Țaran, "Reflecting the sustainability dimensions on the residential real estate prices," *Sustain.*, vol. 13, no. 5, pp. 1–28, 2021, doi: 10.3390/su13052963.

[26] V. S. Pineda and J. Corburn, "Disability, urban health equity, and the coronavirus pandemic: promoting cities for all," *J. Urban Heal.*, vol. 97, no. 3, pp. 336–341, 2020.

[27] R. A. S. Mateus, T. Oliveira, and C. Neves, "Sustainable technology: Antecedents and outcomes of households' adoption," *Energy Build.*, vol. 284, p. 112846, 2023, doi: 10.1016/j.enbuild.2023.112846.

[28] E. Nketiah, H. Song, G. Adu-Gyamfi, B. Obuobi, M. Adjei, and D. Cudjoe, "Does government involvement and awareness of benefit affect Ghanaian's willingness to pay for renewable green electricity?," *Renew. Energy*, vol. 197, pp. 683–694, 2022, doi: https://doi.org/10.1016/j.renene.2022.07.139.