Urban Regeneration and Housing Market Dynamics: Examining the Impact of Brownfield Sites in Malaysia

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ABSTRACT

Urban regeneration efforts often face significant challenges due to the presence of brownfield sites, which pose financial, administrative, and policy issues. These sites can lead to negative environmental and social impacts, reducing the appeal and value of nearby properties. Due to the limited market evidence in Malaysia, this study investigates the impact of brownfield sites on house prices in Johor Bahru using a Multiple Regression Analysis (MRA) model. The research identifies key factors influencing house prices, including proximity to brownfield sites, and examines 691 housing observations over ten years. Results show no significant impact of an abandoned apartment building on house prices, suggesting that distance from certain brownfield sites may not deter buyers. These findings are valuable for property market stakeholders and urban planners, offering insights for future urban regeneration projects. Future research could explore other types of brownfield sites and employ more precise distance measures to understand their impact on the housing market further, supporting urban regeneration goals.

Keywords— urban regeneration, brownfield sites, housing market, property value

INTRODUCTION

Amid rapid urbanization and industrial expansion, brownfield sites previously utilized parcels of land now abandoned or underutilized due to actual or perceived contamination present a significant challenge in numerous developing nations, including Malaysia. These areas, typically remnants of former industrial or commercial use, often lie vacant, under-maintained, and potentially hazardous due to environmental pollutants. Despite their valuable locations within urban centres or growth regions, brownfield sites are frequently disregarded, representing both underutilized physical space and missed economic and social opportunities.

The rapid development of Malaysia is contingent upon the country's economy, which was previously founded on the agriculture sector and has since transitioned to the industrial and construction sectors. Nevertheless, the risk and potential for abandonment issues are inextricably linked to the accelerated advancement of construction. There were numerous concerns regarding the brownfield area. The Ministry of Housing and Local Government (KPKT) published a catalog of 48 abandoned housing projects in peninsular Malaysia, which included 8,932 units, through the National Housing Department Malaysia initiative until 31 August 2017. The gravity of this issue is exacerbated by the numerous issues that arise as a result of the brownfield's existence (Dahlan, 2011). Although the issue of brownfield redevelopment has been discussed since 2008, there are still numerous areas in Johor Bahru that have not been developed (Nurlaila, 2014). Consequently, the Town has developed a proposed guideline in collaboration with the Town and Country Planning Department of Peninsular Malaysia (JPBDSM) to encourage the government in the redevelopment of brownfield sites.

The majority of the existing literature concentrates on the intricacies of brownfield redevelopment, with a

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scarcity of quantitative studies that examined the impact of brownfields on the value of residential properties. The complexity of redeveloping brownfields may be a contributing factor to the scarcity of literature on the impact of brownfields on the value of residential properties. Distressed urban areas, particularly central cities and inner-ring suburbs that were previously extensively industrialized, are frequently linked to brownfields (Davis and Sherman, 2010). Consequently, the objective of this investigation is to assess the impact of brownfields on the value of residential properties.

In Malaysia, brownfield redevelopment is influenced by policies under the Town and Country Planning Act 1976 (Act 172) and the Environmental Quality Act 1974, with local authorities such as KPKT (Ministry of Local Government Development) overseeing urban regeneration projects. Strategic redevelopment aligns with Malaysia's Smart City Blueprint and housing policies, promoting sustainable urban renewal and economic revitalization.

Brownfields in Malaysia can be classified according to their original use and the type of development that previously occupied the site:

1. Industrial Brownfields: These include former manufacturing plants, refineries, mining sites, and chemical factories that have been abandoned or shut down due to economic shifts, environmental contamination, or industrial relocation.

2. Commercial Brownfields: Abandoned shopping complexes, office buildings, and retail spaces that have become obsolete due to changes in consumer behavior, economic downturns, or poor urban planning.

3. Residential Brownfields: Housing projects that were abandoned before completion due to financial issues, mismanagement, or legal disputes, leading to underutilized or deteriorating residential zones.

4. Infrastructure Brownfields: Decommissioned transportation hubs, unused railways, abandoned ports, or former military bases that are no longer functional and require repurposing for urban development.

By understanding these brownfield categories, policymakers, developers, and urban planners can better address redevelopment challenges, minimize environmental risks, and enhance housing market dynamics.

Brownfield And The Housing Market

Brownfields, which are also referred to as abandoned properties, are those that have been abandoned or underutilized as a result of known or suspected contamination. The National Round Table on the Environment and the Economy (NRTEE) has defined brownfield sites as abandoned, vacant, derelict, or underutilized commercial or industrial properties that have been perceived or actually contaminated as a result of past actions and have an active potential for redevelopment. In Malaysia, brownfield is an area that has been abandoned due to neglect or obsolete development structures or development projects that have not been concluded and are abandoned (JPBDSM, 2012). A brownfield area is a distinct phenomenon from a new location that has never been developed. this region may or may not be contaminated. Private and government properties are also included in brownfield land areas.

The term "brownfield" refers to an area that has been developed or abandoned almost entirely, but the implementation period has exceeded ten years. The area has been contaminated in a variety of ways, including economic and aesthetic aspects, as a result of the abandoned undertakings (Ferber & Grimski, 2002). In Malaysia, contaminated and derelict land can be located at a variety of locations, including ex-mining sites, motor workshops, petrol stations, oil depots, former railway yards, bus depots, abandoned rubber factories, landfills, industrial sites, and sites with underground storage containers (Yap, 2014). Hectares of land have been contaminated with organic and inorganic compounds as a result of past industrial activities, including metal plating and petroleum refining, rendering the land unsuitable for future development.

Brownfield areas in Malaysia, typically characterized as previously developed land now underutilized due to potential contamination, are a significant concern in urban and industrial regions. These areas, often found in

states like Selangor, Penang, and Perak, are associated with abandoned industrial sites and former mining lands. The environmental challenges tied to brownfields include soil and groundwater contamination from heavy metals and hydrocarbons, exacerbated by insufficient enforcement of environmental regulations (Ahmad & Wong, 2016; Mohamad et al., 2019). Despite these challenges, brownfield redevelopment offers opportunities for urban renewal, economic growth, and improved living standards. However, barriers such as high remediation costs, limited technical expertise, and inadequate public-private partnerships hinder progress (Ismail et al., 2020).

Policies like the National Land Code 1965 and the Environmental Quality Act 1974 provide a framework for addressing these issues, but implementation gaps remain. Successful redevelopment examples, such as the conversion of Bukit Besi in Terengganu into an eco-tourism destination and the revitalization of industrial zones in Shah Alam, highlight the potential benefits of brownfield projects when well-executed. These projects emphasize the need for sustainable planning, community engagement, and innovative remediation strategies to transform brownfields into valuable assets (Lehigh, et al., 2020). Enhanced incentives and improved regulatory mechanisms are essential to overcome current challenges and maximize the socio-economic and environmental benefits of brownfield redevelopment in Malaysia.

Cohen (2001) posits that brownfields are indicative of other issues that impede revitalization efforts and contribute to neighborhood decline. These issues include the presence of eyesores, fire hazards, and sites for drug-related activity, vagrancy, and rodent infestation. Regrettably, the brownfield area is not a desirable location for developers due to the high cost of redevelopment and the numerous uncertainties, including the applicable legislation (Wedding and Crawford-brown, 2006). Furthermore, the developer is required to submit an application for redevelopment and await the approval process for new projects. The redevelopment process is time-consuming to complete before receiving certification. Consequently, derelict sites have become a significant issue in Malaysia and have become unappealing to property buyers, which is influencing their purchasing decisions. These issues have resulted in a significant number of developers being hesitant to develop brownfield sites due to their concern that the property will not generate profits, as buyers are unwilling to purchase it.

The United States Environmental Protection Agency (US EPA) defines brownfield as a property whose expansion, redevelopment, or reuse may be complicated by the presence or prospective presence of a hazardous substance, pollutant, or contaminant. There have been numerous empirical studies conducted by the US EPA, and the results indicate that brownfield sites have a detrimental effect on house prices, resulting in a price reduction of 2% to 8%. Han (2014) stated in her research that the issues surrounding brownfields are still unclear, whereas Green (2018) suggests that the influence of brownfields on the values of surrounding properties could be astounding.

The decision-making of buyers influences property value. Ismail (1997) asserts that property value is highly responsive to alterations in its environment. Alterations in qualities influence the appreciation or depreciation of property value. Housing characteristics can be categorized into locational, structural, and neighborhood elements (Goodman, 1989; Williams, 1991). Consequently, property value may be influenced by these characteristics.

Geographical features are crucial to property valuation, as individuals frequently pay a premium for sought-after places (Adi Maimun & Yeong, 2024; Prasad and Richards, 2008; Suhaimi et al., 2021; Tan, Adi Maimun, & Daud 2025; Zihannudin et al., 2021). Adi Maimun (2011) asserts that the predominant explanatory capacity of a hedonic model derives from variables that characterize the location of each residence. The location dictates whether a property is classified as rural or urban. Access to the central business district is expected to influence property value due to the concentration of economic and business activities in urban areas. Properties situated at a considerable distance from the urban core typically see a decline in value (Chin and Chau, 2003). Structural attributes denote the qualities and conditions of the property. Adi Maimun (2011) asserts that structural features may encompass neighborhood size, lot size, floor area, amenities, building age, types of materials and finishes, structural quality, kitchen cabinetry, and condition of repairs. The state of structural features can influence property value either favorably or negatively. Neighborhood characteristics are significant factors that influence property values. Neighborhood characteristics can be categorized based on socio-economic factors, municipal services, externalities (Chin and Chau, 2003), and amenities (Roe et al., 2004). Residential neighborhoods equipped with extensive facilities create a robust property market (Nor Asmahan, 2012) as these amenities

stimulate the economic activities of residents in the vicinity.

Alongside location, structural, and neighborhood characteristics, externalities are also factored into the assessment of property values. Brownfields may be classified as externalities because they influence property values. Accordino and Johnson (2000) assert that the majority of brownfields cause economic, health, and sanitation issues. Brownfields present significant environmental hazards that affect human health (Doerle, 2012). They impose considerable externalities on adjacent property owners by diminishing the market value of their properties (Accordino and Johnson, 2000).

Table I Previous Studies On The Effect Of Brownfield On Residential Property Values

Author & Country	**Data**	**Method**	**Result**	**Variables**
Han (2017) United States	● 101,497 transaction (1991-2010) ● House	● Weighted Repeat Sales ● Piecewise Linear Regression Model	Price Discount: **Location** ● 1.5% (within 250 ft. on second sales) ● 1.0% until 2.7% (when the number of nearby abandoned properties increases by more than two between the first and second sale)	**Abandoned property data:** parcel identification number (block and lot number), full address, the dates the Vacant House Notice was first issued and reissued, the type of structure, the tax payment status, and the lot size (The Vacant House File, The Baltimore City Department of Housing and Community Development). **Structural data:** parcel identification (block and lot number), transaction date, deed date, a type of transaction, full address, sales price, and land use code.
Schwarz, Gill, Hanning & Cox (2017) United States	● 18,109 transaction (1997-2005) ● House	● Hedonic Model	Price Discount: **Location** ● 3% (within 0.5 miles) ● 5% (within 1.0 miles)	**Locational data**: Distance from the nearest brownfield **Structural data:** house prices, age of building at the time of the sale, number of bathrooms and bedrooms, lot size (ft.) and whether the house has air conditioning or not.
Han (2017b) United States	● 510 transaction (2001-2010) ● House	● Weighted Repeat Sales ● Hedonic Model	Price Discount: 1.384%	**Neighbourhood data:** level of social organization, neighborhood disadvantage, level of government intervention and neighbourhood housing market characteristics.
Gilderbloom, Meares & Riggs (2016) United States	● 169 transaction (2000-2008) ● House	● Ordinary Least Square (OLS)	Price Discount: **Year 2002** ● $10,342 (within 0.5 miles) ● $6,995 (within 1.0 miles)	**Locational data:** distance from city centre (miles) and distance from brownfield sites (miles) **Structural data**: number of housing units, household income and housing age.

			Year 2006 ● $7,615 (within 0.5 miles) ● $7,556 (within 1.0 miles) ● $6,463 (within 1.5 miles) **Year 2008** ● $11,911 (within 0.5 miles) ● $9,757 (within 1.0 miles) ● $8,261 (within 1.5 miles)	**Neighbourhood data:** total crimes per 100000 residents.
Yap (2014) Malaysia	● 557 transaction (2001-2013) ● House (low-cost terrace, terrace and detached)	● Multiple Regression Analysis (MRA)	Price Premium: **Location** ● 19.6% (1 km from Kemayan City) ● 23% (1 km from Kulai Centre Point)	**Locational data:** distance to Kemayan City (meter) and distance to Kulai Centre Point (meter). **Structural data:** types of title, types of property, number of floors, number of rooms, land area (square meter) and built-up area (square meter). **Neighbourhood data:** distance to nearest school (meter).
Han (2014) United States	● 101,497 transaction (1991 - 2010) ● House	● Hedonic Model	Price Discount: **Location** ● 0.87% (within 250 ft.) ● 0.14% (within 250 to 500 ft.) **Duration** ● 0.17% (abandoned more than 3 years) ● 0.04% (abandoned less than 3 years)	**Locational data:** distance from brownfield sites (ft.) **Structural data:** parcel identification (block and lot number), transaction date, deed date, a type of transaction, full address, sales price, and land use code.
Anna (2007) United States	● 432 sites and 2,682 observations (1980 – 2002) ● Random sample of properties that located in brownfield area.	● Hedonic Model	Price Discount: **Location** ● 38% (located within enterprise zone)	**Locational data:** distance to CBD (meter) and distance to nearest road of any kind (meter) **Structural data:** size of parcel and building capital density.

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Numerous studies have demonstrated that brownfields influence property values. Table I encapsulates prior investigations regarding the impact of brownfields on residential property values. Han's (2017a) study in the United States indicates that an extra abandoned property within 250 feet of a second sale diminishes the value of surrounding properties by roughly 1.5% when foreclosures are also within that distance. When the quantity of adjacent abandoned properties rises by more than two between the initial and subsequent sale, the effect on nearby property values escalates from 1.0% to 2.7%.

Schwarz, Gill, Hanning, and Cox (2017) assert that brownfield size diminishes property values up to 0.5 miles from the closest brownfield, with coefficients revealing a 3% decrease in sales value for every 10,000 sq ft increase in the size of the nearest brownfield, significant at the 5% level for continuous distance (coefficient of −0.026). For discrete distances, brownfield size adversely impacted property prices up to 1 mile (coefficients ranging from −0.006 to −0.031).

Han (2017b) examined the impact of brownfields on residential property values, emphasizing neighbourhood factors including social disorder, concentrated disadvantage, government involvement, and housing characteristics. The research demonstrates a price discount of 1.384% utilizing multiple regression analysis (MRA) on 510 transaction sales in the United States.

A study conducted by Gilderbloom, Meares, and Riggs (2016) investigated the impact of EPA brownfield sites on house values, foreclosures, and premature mortality in Louisville, Kentucky, from 2000 to 2008. The study revealed that in 2000, properties located within a half-mile radius of brownfield sites were valued at $10,342 less than those situated outside that vicinity. When the radius increased to one mile, properties within that area depreciated by $6,995. In 2006, residences located within a half mile of a brownfield site were valued at $7,615 less than those situated beyond that distance. Properties within one mile were valued at $7,556 less, while those within one and a half miles were valued at $6,463 less. In 2008, this trend persisted, with residences located within a half mile of the site valued at an average of $11,911 less, those within one mile valued at $9,757 less, and properties within a mile and a half valued at $8,261 less.

Yap (2014) conducted a study in Malaysia examining the impact of brownfields through an analysis of 557 transaction sales from 2001 to 2013. Yap identified a 19.6% rise in residential property values within 1 kilometer of Kemayan City, an abandoned shopping complex. In residential neighborhoods situated 1 kilometer from Kulai Centre Point, property values rose by 23%. Han (2014) asserts that properties left vacant for over three years diminished property value within 250 feet by around 1%. Properties abandoned for over three years and situated over 250 ft. experience a substantial decline in value. Properties situated between 251 and 500 feet receive a price deduction of 0.27%. For homes ranging from 501 to 1000 square feet, the price decrease is 0.05%, while for those between 1001 and 1500 square feet, the price drop is 0.14%.

A separate study conducted in the United States by Anna (2007) analyzed 432 sites and 2,682 observations from 1980 to 2002, concentrating on contaminated sites and properties within brownfield zones characterized by analogous land use limitations. Anna identified no substantial value for proximity to the city center via the hedonic model. The study indicated that properties in an enterprise zone are sold at a 38% discount; nevertheless, this finding lacks statistical significance.

Frame (2010) and Joice (2011) indicate that the rising incidence of foreclosures, vacant, and abandoned houses nationwide has prompted extensive research and empirical studies assessing the detrimental spillover effects of these distressed properties on neighborhood quality.

METHODOLOGY

This study was conducted in Johor Bahru, the capital of Johor, selected for its significant prevalence of brownfield sites, which pose various environmental, social, and economic challenges. Johor Bahru's rapid urbanization has led to the abandonment of certain developments, making it an ideal case for examining the impact of such sites on residential property values and urban quality.

The study focuses on residential areas affected to varying degrees by brownfield sites, including Taman Sri Putri, Taman Jaya, Taman Harmoni 1, Taman Desa Skudai, and Taman Sri Skudai. A key subject of the research is

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the Wangsa Putri Apartment complex in Taman Sri Putri, which has remained unoccupied for over a decade following its abandonment by the developer, Chemstab Asia (M) Sdn. Bhd. Despite the completion of its structure, the complex has never been operational or inhabited, effectively rendering it a brownfield site within a residential zone.

Fig.1 Study Area

The data collected for this study consists of secondary sources obtained from articles, journals, theses, and official records from Jabatan Penilaian dan Perkhidmatan Harta Johor Bahru (JPPH JB) and Majlis Bandaraya Iskandar Puteri (MBIP). JPPH JB provided transaction data from 2009 to 2018, including detailed records such as district, property address, transaction date, lot number, ownership number, lot type, ownership type, building type, land area, main floor area, ancillary floor area, and storey number, resulting in a total of 691 transaction records. MBIP contributed Geographic Information System (GIS) data, which was used to map both the surveyed residential properties and brownfield locations, facilitating a detailed analysis of properties in proximity to these sites.

To enhance understanding of the issue, a comprehensive literature review was conducted, drawing from sources such as journals, articles, theses, books, legislative acts, and newspapers. This review identified factors influencing residential property values, particularly the effects of nearby brownfield sites. The factors highlighted in the literature are supported by prior studies utilizing the hedonic pricing model. The secondary data collected forms the basis for the model structure by defining the dependent and independent variables.

In this study, the dependent variable is the market value of residential properties, while the independent variables include transaction date, ownership type, lot type, housing type, land area, main floor area, ancillary floor area, number of storeys, scheme area, and distance from the brownfield site.

To quantify the impact of brownfields on property prices, this research employs Multiple Regression Analysis (MRA), a statistical method used to establish the mathematical relationship between a dependent variable (Y) and one or more independent variables (X). MRA helps determine the extent to which independent variables influence the dependent variable by explaining variations in the latter using additional explanatory variables. The standard multiple regression model is represented as follows:

$$Y = a + b_1X_1 + b_2X_2 + \ldots. bnXn$$

(Equation 1)

where Y represents the market value of residential properties, while X_1 to Xn denote independent variables such as transaction date, ownership type, lot type, house type, land area, main floor area, ancillary floor area, number of storeys, scheme area, and proximity to a brownfield site.

To assess the model's validity and the explanatory power of the independent variables, various statistical tests are conducted, including the coefficient of determination (R-square), adjusted R-square, p-value, F-statistics, t-

statistics, estimated standard error (SEE), and multicollinearity analysis (Eelko Huizingh, 1994; Lind et al., 2009).

RESULTS AND DISCUSSION

The correlation analysis revealed no significant association between the dependent and independent variables. However, multicollinearity was detected among the following pairs of independent variables:

1. Ownership type and residential scheme (0.989)
2. Number of storeys and primary floor area (0.916)

To address this issue, one variable from each correlated pair was removed from the model. Since ownership type inherently represents the residential scheme, and storey number is reflected in the main floor area, both residential scheme and storey number were excluded from the analysis.

Following the removal of variables exhibiting significant multicollinearity, statistical analyses were conducted. Table II presents the results for both the linear model and the semi-logarithmic model.

Table II Result For Regression Analysis

Statistical Test	Linear Model	Semi-log Model
R	0.879	0.872
R-square	0.773	0.761
Adjusted R-square	0.766	0.753
SEE	52926.858	0.21882
F	108.412	101.437

Table II shows that the R-squared and adjusted R-squared values for the linear model are 0.773 and 0.766, respectively. This indicates that 76.6% of the variance in housing prices can be explained by the independent variables, while the remaining 23.4% is attributed to external factors not included in the model. The standard error of estimate (SEE) for the linear model is RM 52,926.86.

For the semi-logarithmic model, the R-squared and adjusted R-squared values are 0.761 and 0.753, respectively, meaning that 75.3% of the variation in housing prices is accounted for by the independent variables, while 24.7% is due to other factors. The SEE for the semi-log model is 0.21882.

Both models are considered suitable, as their R-squared values exceed 0.7. The F-values for the linear and semi-log models are 108.412 and 101.437, respectively, demonstrating that the independent variables significantly explain the model.

Table III presents the regression analysis results. The ownership coefficient is negative, indicating a 4.4% (RM 8,336) reduction in price. This discount may be influenced by factors not accounted for in the study, such as distinctions between bumi lots and non-bumi lots or the higher value of leasehold properties compared to older freehold buildings. However, the p-value (0.42) and t-value (-0.81) for ownership are insignificant.

The land area contributes to a 0.2% (RM 451) price premium, significantly affecting house prices, as indicated by a t-value of 7.83. The main floor area also has a notable 0.3% (RM 791) price premium, with a t-value of 10.76. Conversely, the ancillary floor area shows a 0.1% (RM 309) price reduction, which is statistically insignificant, with a t-value of -0.84 and a p-value of 0.40.

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Regarding proximity to brownfield sites:

1. Properties 1 km away experience a 0.3% (RM 313) price discount.
2. Properties 1.5 km away exhibit a 2% (RM 3,785) price reduction, likely due to the brownfield's influence and structural depreciation.
3. Properties 2 km away show a 7% (RM 9,045) price premium.
4. At 2.5 km, prices increase by 3.5% (RM 1,116).
5. Properties 3 km or farther see a 4.2% (RM 6,568) price increase.

Despite these price variations, the regression analysis indicates that brownfield sites do not significantly impact property prices. The t-values for each distance are below 2, and the p-values exceed 0.05, suggesting that the effects are statistically insignificant.

Previous studies utilizing the hedonic pricing model have shown significant price reductions for properties near brownfield sites. However, this research suggests that brownfields exert a negligible effect on property values. This may be due to additional unaccounted factors, such as proximity to UTM and access to major roads. Furthermore, Malaysian residents may exhibit limited concern about brownfield sites, resulting in minimal impact on residential property values.

Table III Regression Results

Model	**Linear Model**				**Semi-log Model**			
	B	**t**	**Sig.**	**VIF**	**B**	**t**	**Sig.**	**VIF**
(Constant)	9243.24	0.47	0.64		11.405	139.14	0.00	
Hakmilik	-8336.15	-0.81	0.42	1.68	-0.044	-1.04	0.30	1.68
Land Area	451.33	7.83	0.00	4.42	0.002	6.30	0.00	4.42
Middle	Reference							
End	-8327.16	-0.90	0.37	3.64	-0.041	-1.07	0.29	3.64
Corner	-20425.91	-1.52	0.13	3.75	-0.054	-0.97	0.34	3.75
Semi-Detached	-10463.51	-0.71	0.48	3.70	-0.037	-0.61	0.55	3.70
Main Floor Area	791.36	10.76	0.00	1.70	0.003	9.98	0.00	1.70
Ancillary Floor Area	-308.69	-0.84	0.40	1.54	-0.001	-0.68	0.50	1.54
Year 2009	Reference							
Year 2010	10013.67	1.01	0.31	1.72	0.053	1.30	0.20	1.72
Year 2011	17378.42	1.96	0.05	1.96	0.096	2.61	0.01	1.96
Year 2012	22102.99	2.64	0.01	2.28	0.102	2.94	0.00	2.28
Year 2013	32726.35	3.45	0.00	1.76	0.180	4.58	0.00	1.76

Year 2014	100757.47	11.38	0.00	1.96	0.499	13.65	0.00	1.96
Year 2015	134364.23	14.74	0.00	1.84	0.616	16.34	0.00	1.84
Year 2016	174066.68	17.82	0.00	1.72	0.767	18.98	0.00	1.72
Year 2017	201554.39	20.84	0.00	1.72	0.839	20.99	0.00	1.72
Year 2018	242690.93	26.21	0.00	1.80	0.966	25.23	0.00	1.80
Buffer 500m	Reference							
Buffer 1.0km	-313.09	-0.06	0.96	1.81	-0.003	-0.11	0.91	1.81
Buffer 1.5km	-3785.39	-0.61	0.54	2.01	-0.020	-0.79	0.43	2.01
Buffer 2.0km	9045.20	0.85	0.40	1.17	0.068	1.55	0.12	1.17
Buffer 2.5km	1116.34	0.06	0.95	1.08	0.035	0.45	0.65	1.08
Buffer 3.0km	6568.45	0.49	0.63	1.13	0.042	0.76	0.45	1.13

CONCLUSIONS

This study examines the influence of brownfields on residential property values in the framework of urban redevelopment. It also analyzes numerous aspects influencing property values, including buyer decision-making processes. The aims were accomplished via a literature review and MRA. The results demonstrate that brownfields influence residential property values. Future research should investigate the classifications and criteria of brownfields, analyze their effects on various property kinds, and assess their influence on rental values using exact distance measurements for enhanced accuracy. This work improves the existing knowledge base by offering novel insights that contrast with earlier research. The findings can assist other researchers in choosing suitable approaches for data analysis. This study assists town planners, policymakers, and local authorities in developing new policies to alleviate the impacts of brownfields and facilitate urban regeneration initiatives.

Future research would benefit from expanding the analysis to include diverse types of properties and incorporating more nuanced variables, such as rental markets and exact distances from brownfield sites. This approach could yield a richer, multidimensional understanding of brownfield effects across various property sectors. Furthermore, a comparative analysis of brownfield sites in different urban settings would provide insights into how geographic, socioeconomic, and regulatory factors influence redevelopment outcomes. Ultimately, this study contributes a foundational perspective to the literature and lays the groundwork for more targeted, effective approaches to brownfield management, which is essential for sustainable urban growth and preserving urban value.

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REFERENCES

1. Accordino, J., & Johnson, G. T. (2000). Addressing the vacant and abandoned property problem. Journal of Urban Affairs, 22(3), 301-315.
2. Adi Maimun, N. H. (2011). Spatiotemporal Autoregressive Model for Malaysian Housing Market Analysis. Doctoral dissertation, Universiti Teknologi Malaysia.
3. Adi Maimun, N. H. and Yeong, K. C. (2024). Swiftlet Farming Industry- A White Gold in the Malaysian Housing Market? Pertanika Journal of Social Sciences & Humanities, 32(4), 1507 – 1522.
4. Anna, A. (2007). Determinants and effects on property values of participation in voluntary cleanup programs: The case of Colorado. Contemporary Economic Policy, 25(3), 415-432.
5. Cohen, J. R. (2001). Abandoned housing: Exploring lessons from Baltimore.
6. Chin, T. L. & Chau, K. W. (2003). A Critical Review of Literature on the Hedonic Price Model. International Journal for Housing Science and its Applications. 27(2), 145-165.
7. Dahlan, N. H. M. (2011). Rehabilitation of abandoned housing projects: a comparative analysis between the law and practice in Peninsular Malaysia and the Republic of Singapore. Commonwealth Law Bulletin, 37(1), 145-173.
8. Davis, T.S. & Sherman, S.A. (2010). Brownfields: A Comprehensive Guide to Redeveloping Contaminated Properties. American Bar Association, Chicago, IL.
9. Doerle, J. M. (2012). Economic perspectives of brownfield development in Germany: an integrated approach. Stuttgart: Department for Environmental Protection, Germany.
10. Eelko, H. (1990). Introduction to SPSS/PC+ 5.0 and data entry. Addison-Wesley Longman Publishing Co., Inc.
11. Ferber, U. & Grimski, D. (2002). Brownfields and Redevelopment of Urban Areas. Report from the Contaminated Land Rehabilitation Network for Environmental Technologies, CLARINET. pp 1.
12. Frame, W. S. (2010). Estimating the effect of mortgage foreclosures on nearby property values: A critical review of the literature. Economic review, 95.
13. Green, T. L. (2018). Evaluating predictors for brownfield redevelopment. Land Use Policy, 73, 299-319.
14. Gilderbloom, J. I., Meares, W. L., & Riggs, W. (2016). How brownfield sites kill places and people: an examination of neighborhood housing values, foreclosures, and lifespan. Journal of Urbanism: International Research on Placemaking and Urban Sustainability, 9(1), 1-18.
15. Goodman, A. C. (1989). Topics in Empirical Urban Housing Demand. In Goodman, A.C., Muth, R.F. (Eds.) The Economics of Housing Markets. London: Harwood Academic Publishers.
16. Han, H. S. (2014). The impact of abandoned properties on nearby property values. Housing Policy Debate, 24(2), 311-334.
17. Han, H. S. (2017a). Exploring Threshold Effects in the Impact of Housing Abandonment on Nearby Property Values. Urban Affairs Review.
18. Han, H. S. (2017b). Neighborhood characteristics and resistance to the impacts of housing abandonment. Journal of Urban Affairs, 39(6), 833-856.
19. Ismail Omar (1997). Penilaian Harta Tanah. Kuala Lumpur: Dewan Bahasa dan Pustaka.
20. Jabatan Perancang Bandar dan Desa Semenanjung Malaysia (2012) Garis panduan perancangan pengenalpastian bagi pembangunan semula kawasan brownfield. Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia, Kuala Lumpur.
21. Joice, P. A. (2011). Neighborhood stabilization program. Cityscape, 135-141.
22. Lehigh, G., Wells, E., & Díaz, D. (2020). Evidence-informed strategies for promoting equitability in brownfield redevelopment. Journal of Environmental Management, 261, 110150.
23. Lind, D. A., Marchal, W. G., & Wathen, S. A. (2012). Statistical techniques in business & economics. New York, NY: McGraw-Hill/Irwin. National Round Table on Environment and The Economy (NRTEE), 2013
24. Nor Asmahan, A. (2012). Faktor-faktor Yang Mempengaruhi Kenaikan Harga Harta Tanah Kediaman di Daerah Kota Setar, Kedah (Doctoral dissertation, Universiti Teknologi Malaysia).
25. Nurlaila, A. (2014). Pembangunan semula Brownfield bagi memenuhi konsep lestari (Doctoral dissertation, Universiti Teknologi Malaysia).
26. Prasad, N. & Richards, A. (2008). Improving Median Housing Price Indexes through Stratification. Journal of Real Estate Research. 30(1), 45-72.

27. Roe, B., Irwin, E. G., Hazel, A., & Jones, M. (2004). The Effects of Farmland, Farmland Preservation, and Other Neighborhood Amenities on Housing Values and Residential Growth. Land Economics. 80(1), 55-75.
28. Schwarz, P. M., Gill, G. L., Hanning, A., & Cox, C. A. (2017). Estimating the effects of brownfields and brownfield remediation on property values in a new south city. Contemporary Economic Policy, 35(1), 143-164.
29. Suhaimi, N. A., Adi Maimun, N. H., & Sa'at, N. F. (2021). Does rail transport impact house prices and rents? Planning Malaysia, 19(2), 141-149.
30. Tan, S. Y., Adi Maimun, N. H., & Daud, S. Z. (2025). The Power of Place: How Location Drives Residential Rental Prices in Kuala Lumpur Educational Zones. Civil and Environmental Engineering Reports, 35(2), 24-34.
31. Wedding, G. C., & Crawford-Brown, D. (2007). Measuring site-level success in brownfield redevelopments: A focus on sustainability and green building. Journal of Environment Management, 85, 483–495.
32. Williams, A. (1991). A Guide to Valuing Transport Externalities by Hedonic Means. Transport Review. 11(4), 311-324
33. Yap, W. W. (2014). The Impact of Brownfield on Residential Property Value. Universiti Teknologi Malaysia.
34. Zihannudin, N. Z., Adi Maimun, N. H., & Ibrahim, N. L. (2021). Brownfield sites and property market sensitivity. Planning Malaysia, 19(2), 121-130.