Management of Brownfield Redevelopment by Local Authority. Case Study Majlis Daerah Hulu Selangor

*Anis Zulfa Johari[1]; Dasimah bt Omar[2]; Siti Mazwin Kamaruddin[3]**
[1] Majlis Bandaraya Seberang Prai, Pulau Pinang MALAYSIA
[2] College of the Built Environment UiTM Selangor MALAYSIA [3]Centre for Postgraduate Studies, College of the Built Environment, UiTM Shah Alam, MALAYSIA*
[*]Corresponding author email: sitim065@uitm.edu.my

ABSTRACT

Received: 2023-02-03
Reviewed: 2023-05-09
Accepted: 2023-06-10

In Malaysia, the issue of brownfield redevelopment has begun in recent years due to the awareness from various parties to achieve more sustainable development goals. The Town and Country Planning Department, Peninsular Malaysia, Ministry of Local Government Development, address this issue through the existing spatial development policies introduced by formulating the National Urbanization Policy and the National Physical Plan. The Twelve Malaysia Plan emphasises the need to redevelop the brownfield area. Hence, the local authority and related agencies are essential in managing brownfield redevelopment in areas within their jurisdiction. Local authorities must monitor brownfield redevelopment projects through the Structure Plan and Local Plan, besides providing an inventory of brownfield areas (National Physical Planning Framework). Among the significant departments in the Local Authority organisation involved in brownfield redevelopment are the planning, building, environment, and engineering divisions. This study in Lembah Beringin, Hulu Selangor, focuses on officer interviews by giving questionnaires. The researchers made observations to determine the situation in the Lembah Beringin area. At the same time, for the results of the interviews, 14 respondents reflected on their roles and interest in managing, monitoring and controlling land use planning, besides encouraging the private sector to redevelop brownfield areas. Thus, this study highlights some recommendations and strategies for management to realise the desire of Hulu Selangor District Council (HSDC) to establish Lembah Beringin as a viable and sustainable area as the brownfield redevelopment that can create job opportunities for residents and reduce new forest exploration. Redevelopment of brownfield sites can help to reduce development pressure on green land (greenfield), protect environmentally sensitive areas and public spaces and is a valuable resource when correctly planned and efficiently managed.

Keywords: *Urban Planning**;** Brownfield; Urban Redevelopment; Urban Management*

INTRODUCTION

With the rapid economic development and the growth of cities in developing countries, hectares of abandoned land and project overflow issues require immediate attention. The Jabatan Perancangan Bandar Dan Desa Semenanjung Malaysia Guidelines of Brownfield stated that these abandoned areas with old structures (2012.) Abandoned land and projects are termed brownfield development (EPA, 2012). Current literature refers to brownfield development as being previously contaminated, derelict, underused, and vacant sites and sites with poor ground conditions characterized by different redevelopment risks (Loures & Vaz, 2018). The existence of the brownfield area reflects the failure of development planning, although it poses excellent potential in curbing urban sprawl (Beames et al., 2018). Brownfield development is an underused land resource (De Valck et al., 2019). The existence of brownfield sites has had negative implications on the health of the environment, public safety, and public life.

Planning and redevelopment of Brownfield land as a valuable dynamic resource, considering its location and characteristics (Preston et al., 2023). Brownfields can impact the quality of soil erosion and habitat, contributing to a climate in micro and further endangering the ecosystem as a whole (Chung-Yang & Talib, 2006). Existing spatial development policies are introduced by the Town and Country Planning Department, Peninsular Malaysia, Ministry of Local Government Development (KPKT), in particular through the formulation of the second National Urbanisation Policy (NUP) (2016) while the current 4th National Physical

Plan (NPP) view abandoned housing as brownfields as a challenging issue that needs a solution. Awareness from various parties has begun in Malaysia and globally that brownfields can contribute to sustainable development with efficient management strategies from stakeholders, including local government, the community, and financial institutions through public-private partnerships (Hurk et al., 2022). Brownfield areas in a city require intervention planned by public authorities to avoid the adverse effects in the long run related to the concentration of people outside the downtown area (Gibilaro & Mataroci, 2019). However, there is scarce published research on the Malaysian local government's intervention in brownfield development. Thus, this study aims to fill this gap by highlighting the perspectives, strategies and actions implemented in brownfield development by a local authority in Selangor as a case study that led to the identification of efficient practices because, with skillful management and creative solutions for brownfield developments, authorities, including planners, can ideally generate economic activity and improve social and environmental conditions while minimizing the strain on public finances (European Commission 2019).

LITERATURE REVIEW

According to Jabatan Perancangan Bandar Dan Desa Semenanjung Malaysia (2012), a brownfield area is an area that has been developed but abandoned or neglected or has a dilapidated structure construction or development area which still needs to be fully completed, and This area may be contaminated or not contaminated. This brownfield area also includes government or private land with abandoned or unsold buildings. This interpretation also refers to abandoned projects of more than ten years.

National Land-Use Database (NLUD, 2006) in England categorises the term brownfield as vacant previously developed land or buildings where under--used previously developed land or buildings allocated in the local plan or with planning permission or under--used previously developed land or buildings with redevelopment potential but no planning allocation or permission or derelict land and buildings (NLUD, 2006). While in Germany, Federal Environmental Agency has carried out pilot studies to characterise the term brownfield within Germany. Hamm & Walzer (2007) describes brownfield as two types of inner city buildings not under use and inner city areas for redevelopment and refurbishment.

Figure 1: The Example of Brownfield Development Area

Moreover, according to RESCUE (2005), the redevelopment of brownfields should be based on the concept of brownfield sustainability. Four dimensions, which are ecology, economy, society, and institution (refer to Figure 2), need to be integrated into forming the sustainability concept, which is the management, rehabilitation, and return to the beneficial use of brownfields in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations in environmentally sensitive, economically viable, institutionally robust, and socially acceptable ways within the particular regional context.

However, according to Mehdipur and Nisar (2013), there has been a specific consensus on the definition of brownfield with different perceptions of each country towards the function of brownfield redevelopment with different geographical factors, social needs, and economic needs, which impact the importance of brownfields to an organisation or institution.

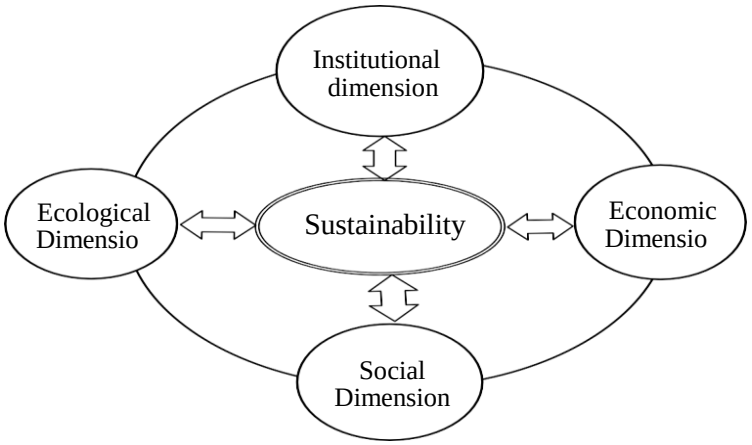

Figure 2: The Dimensions of Sustainability in The Brownfield Redevelopment
Source: RESCUE (2005)

Brownfield Area Categories

Brownfield area could mean a contaminated area, covering abandoned buildings or buildings already completed but not sold in more than ten years, either on government or private land. Urban development programs in developed countries place a priority on the development of both contaminated and brownfield lands. In order to facilitate the planning and development in Malaysia, the Department of Town and Country Planning Peninsular Malaysia outlined six brownfield categories according to the types of areas (Table 1).

Brownfield Area Criteria

Brownfield sites identified according to Jabatan Perancangan Bandar Dan Desa Semenanjung Malaysia a (2012) referring to Act 172 (Town and Planning Act 1976) by all or any one or combination of the following criteria:

1. Development areas that have been vacated or dilapidated
2. Incomplete and Abandoned construction area
3. Development areas where activities initially been stopped and will not be continued

Figure 3: Category A of Brownfield

Figure 4: Category B of Brownfield

Figure 5: Category C of Brownfield

Figure 6: Category D of Brownfield

Figure 7: Category E of Brownfield

Figure 8: Category F of Brownfield

Table 1: Types of Brownfield and Categories

Type of Brownfield	Categories
Former mining / quarrying	A
The former landfill site that has full / no longer used permanently	B
Factory / business / residential / institution area that has been abandoned for more than 10 years	C
Abandoned development projects that are not completed within the construction exceeding 10 years	D
Building / row of lots of buildings that have been completed but abandoned over 10 years	E
The former depot / public transport station, infrastructure and utilities	F

Source: Brownfield Field Study 2007, Department of Town and Country Planning Peninsular Malaysia

The expansion of urban areas is due to the impact of the fast-paced growth of urbanisation and urban sprawl in Malaysia have led to all brownfield area categories. The results of a comparative analysis based on a study conducted by the Ministry of Housing and the Local Government Malaysia (2004) and the National Solid Waste Department Malaysia (2012) showed the increase in quantity and urban space coverage of ex--landfill defined as a non--operating landfill where waste disposal activities have been laid off or completed (Ministry of Housing and Local Government Malaysia, 2004). Brownfield sites include abandoned buildings, dilapidated

and neglected, and abandoned projects that would impair the city's image or the 'eye--sore'. It requires the development of actions, as appropriate, to recover and improve the city's image. These guidelines include approaches to urban design that create an image of a more beautiful. Adding value to an urban property and creating investment opportunities. Brownfield sites are a liability for the economy for the land owned by the government, private sector or private. If not developed, brownfield sites have no economic value that can generate revenue and income and are also a government liability. The effect will bring down property values and affect the property's market value in the surroundings. From an economic perspective, redeveloping brownfield sites will give higher returns.

METHODOLOGY

The case study is the local authority, Hulu Selangor District Council (HSDC), management of the brownfield areas at Lembah Beringin, Sg. Gumut, Hulu Selangor.

Table 2: The Major Population in Towns of Selangor

Rank	City	Population (2016)
1	Klang	1,089,099
2	Ampang	788,145
3	Subang Jaya	767,899
4	Shah Alam	680,211
5	Petaling Jaya	644,291
6	Cheras	633,002
7	Kajang	480,277
8	Selayang Baru	265,297
9	Gombak	162,084
10	Rawang	158,904

Source: Portal Kerajaan Negeri Selangor Darul Ehsan : www.selangor.gov.my

Based on Table 2, the study area has the lowest population with less development. Figure 8 shows the development trend resulting from the country's growth. In some districts, according to the HSDC Local Plan Study 2020, Hulu Selangor and Hulu Langat districts are the areas that have been and will continue to receive spillover development from Kuala Lumpur. Currently, Hulu Selangor District has various mega projects such as Second National Automobile or Perodua, industrial, housing, tourism, modern cities in Bukit Beruntung and Bukit Sentosa, Sungai Buaya, Serendah, Batang Kali and Beringin Beringin in Kerling. The construction of the PLUS highway interchange in Bukit Beruntung and Lembah Beringin further enhanced the development of this area.

Land Use, Population and Settlement Hierarchy of Hulu Selangor

Based on spatial analysis of potential factors and obstacles and the direction of Hulu Selangor, the planned land use defines or outlines the land use types, either primary or support land use. Table 3 shows land use activities in the Hulu Selangor district, where forestry and agriculture land use dominate the total use of land in Hulu Selangor. Meanwhile, Table 3 indicate the total area divided by the planning block. (Hulu Selangor District Council Local Plan 2020).

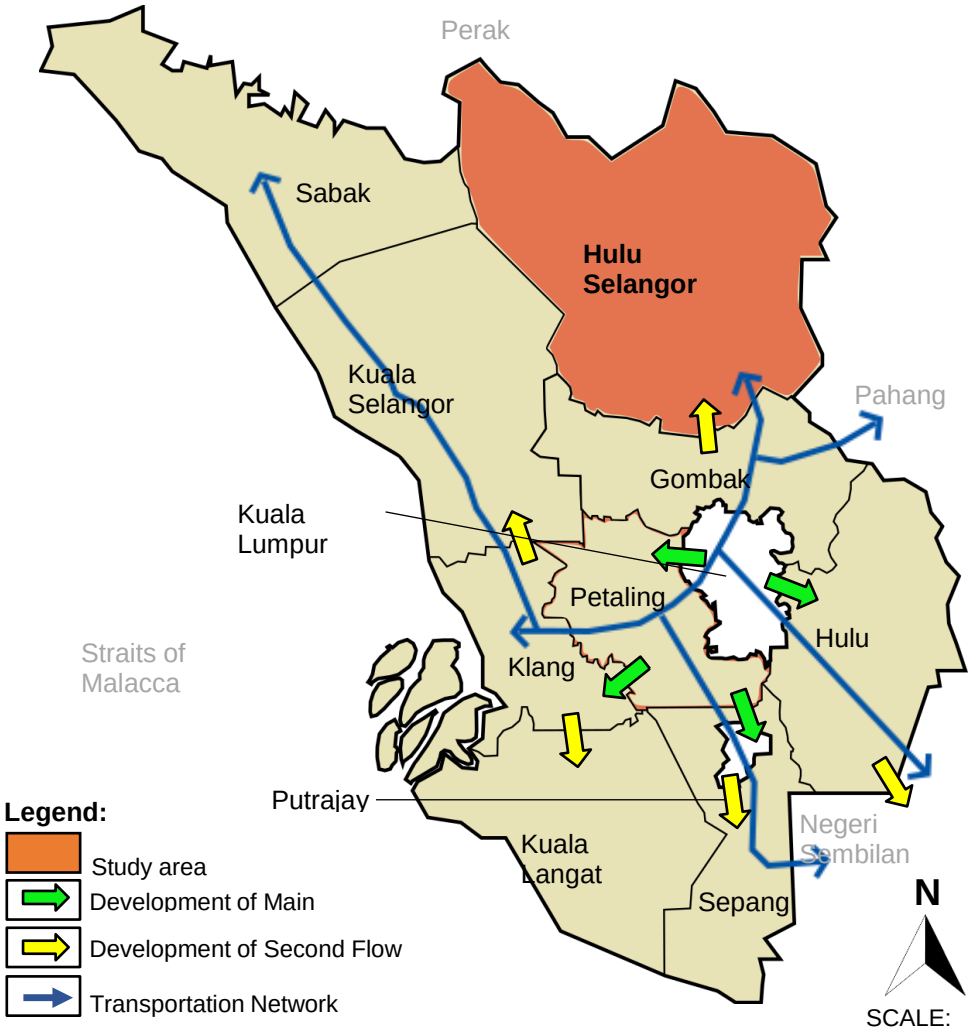

Figure 8: Development Trends in Selangor State
Source: Hulu Selangor District Council (HSDC) Local Plan 2020

Table 3: Current Land Use Activities in Hulu Selangor

Land Use	Area (Hectare)	Percentage
Housing	13,442.18	7.65
Commercial	2,005.21	1.14
Industries	2,816.65	1.60
Institution and Public Facilities	1,589.80	0.91
Open Space, Recreation Area and Forestry	5,617.90	3.20
Transportation	5,617.90	4.05
Infrastructure and Utility	641.05	0.37
Agriculture	45,612.35	25.97
Fisheries and Aquaculture	555.77	0.32
Forestry	91,916.61	52.34
Water bodies	4,319.77	2.46
Total	**175,630.11**	**100.00**

Source: Hulu Selangor District Council (HSDC) Local Plan 2020

Hulu Selangor Brownfield Areas

Based on field studies conducted by Majlis Daerah Hulu Selangor, Brownfield areas (based on the definition set out in the Brownfield Area Identification and Redevelopment Guidelines) are concentrated around Bukit Beruntung area, Bukit Sentosa, Prima Beruntung, Lembah Beringin, Desa Beringin, Taman Malim Mas, Taman Akasia, Legend Farm, Lembah Jati (Green Valley) and some areas involved with the expansion project. The Brownfield area in these areas is either developed or sold but has a shallow occupancy rate (less than 20%) or abandoned (MDHL Plan (2020).

Brownfield areas in Hulu Selangor or abandoned development areas have a low occupancy rate of less than 20%. For low-income areas, property types vary from apartments, shop houses and terraced factories primarily located in Bukit Beruntung, Bukit Sentosa and Prima Beruntung areas (MDHL Plan (2020) (see Table 4) and Photos 3.1- 3.6.

Table 4: List of Brownfield Areas in Hulu Selangor District

Brownfield Area	Land Use Components
Bukit Sentosa 1	Low-occupancy apartments (Seri Ros I & II)
	Abandoned college (Kolej Aman)
	1 & 2 Storey Terrace Industry (Jalan Seri Pagi and Jalan Bunga Raya)
Bukit Sentosa 2	Low-occupancy apartments (Seri Anggerik I, II & III, Seri Mawar and Seri Inai)
	Industry and Shop Houses Area (Jalan Seroja)
Bukit Sentosa 3	Low-cost apartments (Seri Kemboja, Seri Bakawali, Seri Telipot and Seri Teratai)
	Shop Houses Area (adjacent to Jalan Kemboja housing)
Bukit Beruntung 1	Low-occupant apartments (Seri Semarak, Seri Lily, Seri Tanjung and Seri Seroja)
	Industry Area (Jalan Jenjarom)
	Shop Houses (Jalan Trompet)
Bukit Beruntung 2	Low-occupancy apartments (Kekwa and Melati)
Bukit Beruntung 3	Low-occupancy apartment (Widuri)
	Shop Houses Area
Prima Beruntung	Low-occupancy apartments (Anggerik I and II)
	Detached House (Jalan Mawar and Jalan Anggerik)
	Shop Houses Area (Jalan Mawar)
Desa Beruntung	Desa Beruntung Housing Project
Lembah Beringin	Lembah Beringin Project
Rasa and Kerling	Projects enlargement village in Kampung Jawa Batu 2, Kuala
	Kerling, Desa Bukit Bujang (Phase 2) and Kampung MelayuRasa, Jalan Ampang Pechah
Batang Kali	Involves Lembah Jati (Genting Valley) project, Taman Akasia
	dan Legend Farm
Hulu Bernam	Taman Malim Mas, Hulu Bernam

Source: Hulu Selangor District Local Plan, 2020

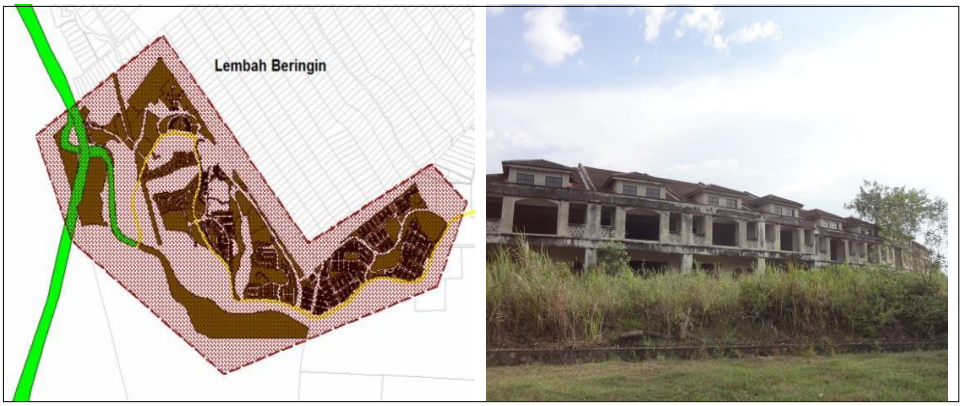

Figure 9: Brownfield Site in Lembah Beringin (Study Area)
Source: Hulu Selangor District Local Plan, 2020

Figure 10: Brownfield Site in Bernam Jaya (Hulu Bernam)
Source : Hulu Selangor District Local Plan, 2020

Figure 11: Brownfield Site in Desa Beruntung, Hulu Selangor
Source: Hulu Selangor District Local Plan, 2020

Figure 12: Brownfield Site in Prima Beruntung, Hulu Selangor
Source: Hulu Selangor District Local Plan, 2020

Figure 13: Brownfield Site in Bukir Sentosa 1 & 2, Hulu Selangor
Source: Hulu Selangor District Local Plan, 2020

Figure 14: Brownfield Site in Bukit Beruntung 1 & 3, Hulu Selangor
Source: Hulu Selangor District Local Plan, 2020

DATA ANALYSIS AND FINDINGS

Interviews were conducted face to-face with government agencies which are Hulu Selangor District Council, Selangor State Town and Country Planning Department, Town and Country Planning Department of Peninsular Malaysia and Selangor Housing and Property Board, to obtain the necessary information for the survey.

Face-to-Face Interview

Seidman (1998) stated that a face-to-face interview is a data collection method when the interviewer directly communicates with the respondents through the prepared questionnaire. According to the Jabatan Perancangan Bandar Dan Desa Semenanjung Malaysia (2012), the involvement of stakeholders helps identify the location and status of abandoned projects, as well as the consent of the definition and the categories of brownfields used in the State of Selangor.

In this study, the respondents from the local authority (HSDC) and four (4) other agencies were willing to be interviewed to give some information and revise the brownfield panning for this research. The fourteen officers interviewed were attached to the local, state and federal authority planning departments, national housing department, and state housing board. The respondents requested to remain anonymous but were willing to be interviewed.

Table 5 below shows 14 officers from the local authority and agencies related to developing and managing brownfield areas in the study area.

Table 5: List of Agencies and Respondents of the Study

Agency	No. of respondents
Hulu Selangor District Council	4
National Housing Department, Ministry of Urban Well-being, Housingand Local Government	2
Department of Townand Country Planning , Selangor State	4
Department of Town and Country Planning, Peninsular Malaysia	2
Selangor Housing andProperty Board	2
Total	**14**

Hulu Selangor Brownfield Area Analysis

The HSDC respondent informed that HSDC has the highest brownfield area in Selangor, and management is under its administration. From the current information, the findings of the brownfield area of 82% of which 32 are brownfield areas Category C. Category D covers 12.8% of the five (5) areas, and Category B and E each comprise one (1) area under HSDC administration area as shown in

Table 6: Total Area of Brownfield by Category in HSDC

	Brownfield Category	Total	Percentage
B	Waste Landfill Former	1	2.60
C	Development Project Abandoned during theimplementation or abandoned more than 10 years	32	82.00
D	Area / building / row of building lots thathave been completed but abandoned for more than 5 years	5	12.80
E	Depots former area / stations of public transport, infrastructure facilities andabandoned public utilities	1	2.60
	Total	**39**	**100.00**

Source: Department of Town and Country Planning (2016)

The findings from the interview revealed that among the causes of the brownfield area is the issue of buildings being unoccupied for more than 50% (Table 7).

Table 7: The Causes of Brownfield Area in HSDC

Causes of Brownfield	Total	Percentage
Buildings that are not occupied more than 50%	28	53
Dilapidated buildings / unsafe for living	13	24
Developers go bankrupt/ financially very weak	5	9
The internal management problems of the developer	4	8
Projects without license (no approval of building plans / status of land)	2	4
Operation Has Stopped	1	2
Total	**53**	**100**

From the current site status, 79% of 42 areas are abandoned project sites where construction work is complete but abandoned. In comparison, 17% of 9 areas led to construction work being stopped and abandoned. Table 8 below shows the current status of the brownfield in Hulu Selangor.

Table 8: Current Status of Brownfield Area in Hulu Selangor

Current Status of Brownfield Area	Total	Percentage
Abandoned - construction work has been completed and abandoned or building that had been inhibited	42	79
Abandoned - construction work stopped and abandoned	9	17
Earthworks - land clearing has been made	2	4
Total	**53**	**100**

Based on the HSDC Local Plan, the total area of Lembah Beringin is about 842.25 hectares. Regarding current land use, the development of Lembah Beringin is less than 30% of the buildup area. In comparison, nearly 70% of the study area is vacant land partly filled with abandoned buildings and bushes. The respondents from the local authority stated that the original developer of Lembah Beringin is Lembah Beringin Sdn.Bhd. (LBSB) where formed three (3) development phases: Phase 1 of 301.01 hectares, phase 2 of 117.06 hectares and Phase 3 of 424.18 hectares. The company experienced financial difficulties due to the economic recession in late 1997. Construction of the property in Lembah Beringin, scheduled for completion in 1999, has yet to be completed, and developers have stopped all construction works. Lembah Beringin Project was declared abandoned by the Ministry of Local Government on 31 December 2001. The Kuala Lumpur High Court has appointed Ferrier Hodgson MH Sdn. Bhd as the liquidator to administer LBSB on 11 November 2005. As per the interview in 2017, after almost 18 years, the project site continued to be abandoned without any initiative by the original developer and liquidator to recover.

The main issue faced in Lembah Beringin development from the aspect of land legislation is in terms of land ownership which has undergone various changes in the sale of land plots previously approved by the original developer to several new owners. Thus this makes it difficult for landowners to apply for land titles as the status of the land, either sold or unsold, cannot be verified.

Individual buyers bought almost 90 per cent of completed units report from recent Hulu Selangor Land Office updates. However, there is a complication in the preparation of the Memorandum of Transfer (MOT) by the original developer, LBSB. Thus this has resulted in property buyers (victims) being unable to prove the right of ownership of property purchased absolutely and only on a Sales and Purchase Agreement (SPA).

The information provided by the respondents has given a picture of the scenario, causes, current status and the condition of the Hulu Selangor brownfield area. Thus, the findings can be summarised based on the data information given and the observation method by making SWOT analysis consisting of strengths, weaknesses, opportunities and threats of brownfield development, which presented in Table 9.

Table 9: SWOT Analysis for Hulu Selangor Brownfield Area

SWOT	Justifications
Strength	• Extensive and potential land for development. • Development pressure concentrated around major cities and border areas spurred development in the Hulu Selangor District. • Most of Bukit Beruntung, Bukit Sentosa and Prima Beruntung brownfield areas comprise development areas that have been developed for industry, institutional, commercial and residential purposes.
Weakness	• Inefficient and ineffective spatial development and the useof non-optimum buildings creating brownfield areas. • Abandoned project sites cause poor soil erosion, scenery,images and environmental pollution. • There are still a lot of empty land yet to be developed in Lembah Beringin (70%) • Occupancy rates for completed properties in new towns such as Bukit Beruntung, Bukit Sentosa, Prima Beruntung and Lembah Beringin are very low (30%) • The atmosphere of the real estate market in Hulu Selangor District is passive, property market value and rental rates are low thus creating brownfield areas.
Opportunities	• Pressure development from Kuala Lumpur and Rawang affects the development of brownfield.

	• Location of brownfield areas such as Bukit Beruntung, Bukit Sentosa and Prima Beruntung have a good accessibility whichare adjacent to the North-South Expressway (PLUS) • Two major car makers namely Perodua and Taman Chong Motor as the catalyst for development.
Threat	• New developments without taking into account the need to develop lead to intensification of brownfield areas.

CONCLUSION

In the context of brownfield development, the following issues are:

- *Brownfield Sites Are Not Attractive to Developers*Although brownfield sites are a potential area for development, they are not attractive to developers because there is considerable cost and risk uncertainty in the requirements for implementation by the local authority.
- *Brownfield Area Has No Profitable Value*
- Brownfield areas or land owned by the government and private sector is a liability as they do not generate revenue or income through economic activities (Zihanudin&Maimun, 2021). The effect of abandoned areas may bring down the market and property values of surrounding properties.
- *Brownfield Sites Ownership is problematic*
- The problem of different strata titles or ownership is a constraint in brownfield redevelopment. In redeveloping the area, all parcel owners must consent, but not all owners may agree to sell the title.

The core problem that causes the brownfield area in the Hulu Selangor District is the absence of a significant catalyst that can generate development in the area and thus attract people to get there. In addition, safety factors, non-maintenance and lack of public amenities such as transport and schools, incompatibility of the types of properties offered and the financial difficulties developers face have contributed to low occupancy rates and abandoned projects in Hulu Selangor.

In mitigation, HSDC is continuously identifying areas of brownfield. HSDC may use the power source under Section 38 of the Town and Country Planning Act 1976 to declare any part of its administrative area as a development area. It is, therefore, the duty of the HSDC to be the local planning authority to acquire all land in the area and to develop the area according to the local plan. The information goes to the State Housing and Property Board. Respondents also mentioned that HSDC needs to find investors and developers interested in redeveloping abandoned areas by facilitating planning permission and fees. The redevelopment in the Lembah Beringin area includes upgrading the infrastructure, expanding the existing road and increasing access to the Lembah Beringin area. HSDC should work with the Malaysian Public Works Department to upgrade existing roads. In addition to rebuilding abandoned buildings, public amenities such as transportation, health, and safety need to be underlined and create job opportunities by looking at potential business and industrial development areas. HSDC has also become more alert to advise and monitor developers to provide facilities based on population total before the planning permission is submitted. The development should follow the guidelines of HSDC and planning authorities for efficient planning control and successful redevelopment.

As per the provisions of subsection 16 (2), the Town and Country Planning Act 1976 (Act 172), the State Planning Committee may instruct the local planning authority to alter local plans with an immediate term. In the event of any change or amendment, the developer must retrieve the approval of the planning permission from the HSDC.

The HSDC has become more alert to the importance of checking developers' records and financial backgrounds. HSDC must work with other government agencies to provide adequate public facilities and effective infrastructure development to accommodate future populations.

AUTHOR CONTRIBUTIONS & CONFLICT OF INTEREST

Author Anis Zulfa bt Johari wrote the manuscript in consultation and supervision of authors Dasimah bt Omar and Siti Mazwin bt Kamaruddin, who provided critical feedback and helped shape the research, analysis, and manuscript. All authors discussed the results and contributed to the final manuscript. Finally, the authors declare that there is no conflict of interest.

REFERENCES

Beames, A., Broekx, S., Schneidewind, U., Landuyt, D., van der Meulen, M., Heijungs, R., & Seuntjens, P. (2018). Amenity proximity analysis for sustainable brownfield redevelopment planning. *Landscape and Urban Planning*, *171*, 68-79. https://doi.org/10.1016/j.landurbplan.2017.12.003

Chun-Yang, S. Y., & Talib, I. P. D. S. A. (April 2006). *Overview of Brownfields in Malaysia*. Jurutera Bulletin.

Department of Town and Country Planning Peninsular Malaysia (2007). *Kajian Lapangan Kawasan Brownfield, Jabatan Perancangan Bandar Dan DesaSemenanjung Malaysia.*

De Valck, J., Beames, A., Liekens, I., Bettens, M., Seuntjens, P., & Broekx, S. (2019). Valuing urban ecosystem services in sustainable brownfield redevelopment. *Ecosystem Services*, *35*, 139-149. https://doi.org/10.1016/j.ecoser.2018.12.006

EPA (2012) Brownfields Program Achievements Linked to Early Success, United States Environmental Protection Agency, US.

European Commision 2019 Brownfield development in the EU ttps://documents1.worldbank.org/curated/en/754171468295822120/pdf/550090WP0P118011PUBLIC10 brownfields.pdf

Evans, Paull. 2008

Gibilaro, L., & Mattarocci, G. (2019). Brownfield areas and housing value: Evidence from Milan. *Journal of Sustainable Real Estate*, *11*(1), 60-83.

Hamm, G. F., & Walzer, N. (2007). Returns from redeveloping Brownfields: Preliminary estimates. *Community Development*, *38*(2), 87-98. Hulu Selangor District Council Local Plan - Rev. 1, 2020

Hulu Selangor District Council Official Portal (http://www.mdhs.gov.my). Retrieved on 13 October 2017 and 2020 Local Plan

Hurk v., M., Williams, D., Luis dos Santos Pereira, A., & Tallon, A. (2022). Brownfield regeneration and the shifting of financial risk: between plans and reality in public-private partnerships. *Urban Research & Practice*, 1-22

Jabatan Perancangan Bandar Dan Desa Semenanjung Malaysia dan Kementerian Perumahan Dan Kerajaan Tempatan (2012), *Garis Panduan Perancangan, Pengenalpastian Bagi Pembangunan Semula Kawasan Brownfield*, Jabatan Perancangan Bandar Dan Desa Semenanjung Malaysia

Laws of Malaysia (2006), *Town and Country Planning Act, 1976 (Act 172).* The Commissioner of Law Revision Malaysia. Malaysia: Percetakan Nasional Malaysia Bhd

Mehdipour, A., & Nia, H. R. (2013). The role of brownfield development in sustainable urban regeneration. *Journal of Sustainable Development Studies*, *4*(2).

Ministry of Housing and Local Government. (2004). The study of safe closure and rehabilitation of landfill sites in Malaysia. Kuala Lumpur: Ministry of Housing and Local Government.

National Solid Waste Department Malaysia (2012)

NLUD, 2006 https://www.gov.uk/government/statistics/national-land-use-database-land-use-and-land-cover-classification

National Urbanisation Policy (NUP) (2016)

Preston, P. D., Dunk, R. M., Smith, G. R., & Cavan, G. (2023). Not all brownfields are equal: A typological assessment reveals hidden green space in the city. *Landscape and Urban Planning*, *229*, 104590.

RESCUE (Regeneration of European Sites in Cities and Urban Environments). (2005).Development of an analytical sustainability framework for the context of Brownfield Regeneration in France, Germany, Poland and UK. Retrieved from http://www.rescue.europe.com

Seidman, I. E. (1998). Interviewing as qualitative research: A guide for researchers in education and the social sciences (2nd ed.) New York: Teachers College Press

Special Action Plan Lembah Beringin Brownfield Area Development Study (2016). Hulu Selangor District Council.

Zihanuddin N.Z and Maimun N.H.A (2021) Does Brownfield Sites Impact On Nearby Property Prices? E-Proceeding: VGoGreen 2020