



PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 21 ISSUE 3 (2023), Page 296 – 302

THE IMPACT OF URBAN RIVERFRONT DEVELOPMENT ON INDUSTRIAL PROPERTY MARKET VALUE: A GIS APPLICATION

Siti Zaleha Daud¹, Ibrahim Sipan², Hishamuddin Mohd Ali³, Nor Fatimah Abd Hamid⁴

*Real Estate Department,
Faculty of Built Environment and Surveying,
UNIVERSITI TEKNOLOGI MALAYSIA*

Abstract

The impact of Urban Riverfront Development (URD) affords an increasing of value for adjacent industrial properties within riverfront area. However, the impacts in terms of percentage of increment value, radius of impact coverage, distribution of industrial properties that effected by URD are difficult to be evaluated without using an appropriate tool. Hence, this study evaluates the impact of URD on industrial property market value aided by Geographic Information System (GIS). Therefore, Melaka River, Malaysia has been chosen as a case study to evaluate the impact of URD towards industrial property market value for adjacent properties within riverfront area. The result shows there is 14.13% of increment of market value for adjacent 1.5-storey factories located within 300-meter radius from URD. The result discovered that there is positive effect on increment market value for the industrial properties within URD area.

Keywords: Urban Riverfront Development, Industrial Property, Market Value, Geographic Information System

¹ Senior Lecturer at Universiti Teknologi Malaysia. Email: sitizalehadaud@utm.my

INTRODUCTION

Urban Riverfront Development (URD) is specifically identified as riverfront development which located within an urban area. Riverfront development within the urban areas is one of several nature-based social infrastructure developments which has capability to spur the social and economic growth within the river area (Abdullah, 2002). Typically, the development of URD always associated with other mix development surrounding riverfront area such as properties buildings including commercial, residential, industrial as well as infrastructure development as it contributes to regional economic growth. It is due to the URD have potential to spur economic development within surrounding area. According to Davidson (2009), in numerous countries around the world, the water edge regions grew sooner than different zones and turned into an advantageous area for the development of urban areas. As per Otto, et al. (2004), rivers have been used for urban settlements in North America due to crusade of the community trades relied on waterway transportation. In addition, the rivers were continually being an essential element of the urban area as it used as a transport network in North America (Davidson, 2013). Therefore, this paper focuses on the impact of URD toward industrial property market since it has rarely emphasized in deliberating on the development of economic growth of the country.

LITERATURE REVIEW

1. Impact Assessment of URD in Malaysia

Impact assessment is an assessment that frequently conducted to assess impacts or any consequences if any development projects, policies and programmes (Chadwick and Glasson, 2017). This assessment is essential in order to ensure 1) the development projects are being managed efficiently; 2) the policies and programmes are beneficial to stakeholders; and 3) the verified impacts are promoted to related stakeholders (Streatfield and Markless, 2009). Impact assessment has been practiced more than 40 years since the sketch out of National Environmental Policy Act 1969 (NEPA) in USA up to now (Nolon, 1996). In Malaysia, impact assessment tools used for assessing social, economic and environmental indicators are fairly confusing depiction among practitioners and stakeholders in Malaysia. The problem occurs when the practitioners utilize SIA tool to assess the social indicators, at the same time it's been included together with the economic indicators. This issue affected the impact assessment practice particularly in assessing the impacts of the URD in Malaysia. Therefore, based on issues that impeded the impact assessment practice in Malaysia, this study is trying to emphasize economic aspect within impact assessment practice for URD in Malaysia.

2. Property Market as a Vehicle of Economic Growth

Economic growth often associated with real estate industry. Then, property market is one of economic indicators within real estate sector as it drives the economic growth of the country. Furthermore, URD has capability to boost up real estate industry due to support property development and redevelopment either commercial or residential as well as industrial properties within adjacent riverfront area (King's Lynn Marina Master Plan, 2007; Smoky Hill River Renewal Master Plan, 2010). According to Olszak Management Consulting et al. (2012), the development of URD frequently involves new development within riverfront properties and thus, it is desired to carry out several analyses that related to property market. For Lehigh Riverfront Master Plan which proposed for city of Allentown, Pennsylvania, the types of property development came after URD development are retail, restaurant, entertainment, hotel and housing or residential scheme area. It demonstrates that the development of URD encourage more property development along the river.

3. URD affects Industrial Property Market Value

As discussed in above mentioned, there are numerous literatures had proved that the development of URD increases property value of riverfront properties (Gross et al. 1981; Jones, 1998; Stein 2001; Nicholls, 2001; Anderson and West, 2006; King's Lynn Marina Master Plan, 2007; Hui et al., 2007; Hui, et al. 2009; Saayman, et al. 2009; Wallner, 2013; and Huang, 2014). This is due to the uniqueness of the URD as a valuable natural resource located within the urban areas with regards to sustainable urban infrastructure development able to be beneficial to surrounding neighborhood area includes local community Abdullah (2002) and Hussein (2009) and simultaneously influences the value of the adjacent properties (Sasaki Associates, 2015). As supported on the location issue, there are many researchers had emphasized that the location is an essential factor that determines the property value (Gallimore et al., 1996; Anderson and West, 2006; Samaha and Kamakura, 2008; Value, 2010; Icano and Levinson, 2011; Kovack, 2012; and Adegoke, 2014). In this regard, the property located within the URD areas will be have a great opportunity to increase the value.

RESEARCH METHODOLOGY

This study utilizes spatial analysis to measure the impact of URD on industrial property market value. The assessment considered the spatial elements within the case study area that has been conducted through graphical visualization which has been displayed via maps. Among of the analyses involved in spatial measurement are overlay analysis, buffer analysis and viewshed analysis. All the technical analyses have been conducted to produce spatial distribution map for the industrial property buildings along Malacca River. Then, to quantify the increment of industrial property market value of adjacent riverfront properties,

the riverfront properties has been observed and evaluated in terms of 1) location of the properties (i.e., inside and outside the buffer zone); 2) property values (i.e., property prices ranges) for the industrial properties within URD area (i.e., 1.5-Storey factories). Ideally, this assessment is initially carried out based on a technical procedure known as geo-coding to assign the location points of each riverfront properties (i.e., longitude and latitude). This procedure has been carried out using google map and ArcGIS 10.4 software. By utilizing the properties owners' address that has been taken from sale transactions' database, the actual locations of the properties have been assigned in the map as per real world. This procedure involved a total of 8000 of sale transactions in year of 2016.

Finally, a simple statistical analysis has been used to calculate the extent to which the increment in industrial property value effected by URD. For the assessment during this phase, the location and position of the properties are considered and observed either it located inside or outside the buffer zone. For the spatial assessment and measurement, it was based on suggestion by [29] which identified an effective distance for a single buffer zone in effecting the URD is within 300 metres radius from the river. Therefore, this study used this distance for the analysis.

FINDING AND RESULTS

Fig. 1. illustrates the impact of URD on industrial property market within riverfront area. Based on the figure above, the allocation of industrial properties (i.e., 1.5-storey factory) within URD area was differentiated by the river segment's catchment area (i.e., buffer zone of 300 metres radius) which has been showed in different color on the map. From the sale transaction's database, it revealed that the price ranges of industrial properties which located inside the buffer zone are higher than properties located outside the buffer zone even though it has the same built-up area in ranges of 180-300 square metres. The identified price ranges of the inside and outside catchment area are different with RM5250,000 – RM1,630,300 and RM235,000 – RM1,400,000 respectively. It meant that there were influenced by locational attributes within the URD area that able to increase the value of the affected properties. This circumstance had also supported by previous literatures which had stressed that the URD development provides beneficial impacts on surrounding neighbourhood (Nicholls, 2001; Anderson and West, 2006; and Zhang et al., 2011) includes enhanced the value of adjacent riverfront properties (Gross et al. 1981; Jones, 1998; Stein, 2001; King's Lynn Marina Master Plan, 2007; Saayman et al. 2009; Smoky Hill River Renewal Master Plan, 2010; Nai and Sargent, 2013; and Huang and Kao, 2014).

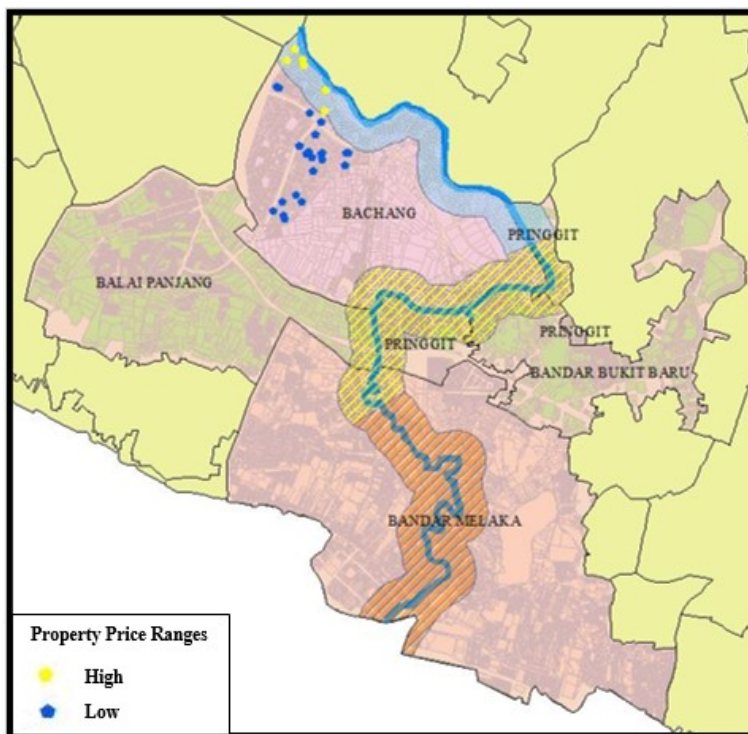


Figure 1: Result of URD impacts on industrial properties within river catchment's area
 Source: Researchers (2019)

Table-I: Increment Value of Industrial Property Buildings

Property/ Building Types	Price Ranges		Increment Value (%)
	Inside Buffer Zone	Outside Buffer Zone	
Industrial / 1.5 - Storey factory	RM250,000- RM1,630,300	RM235,000- RM1,400,000	14.13

Source: Property Sale Transaction 2018 of Malacca Tengah Area

Table I shows the increment value of Industrial property buildings (i.e., 1.5-Storey factory) of adjacent riverfront area. Based on the above table, the finding had revealed that there was an increasing of property market values for industrial property buildings were located inside the buffer zone (i.e., within 300 metres radius from the URD). According to the results, it has indicated that the percentage of increment value for industrial property buildings of 1.5-storey factory is 14.13%. The finding demonstrated that it has positive impact in term of property market value for industrial property buildings along the riverfront area. It was identified that the neighbourhood location and its attributes had

influenced the industrial property buildings along Malacca River and thus, increased the property market value of the adjacent properties.

CONCLUSION

Overall, this paper discussed the nature of impact assessment of URD in Malaysia. Then, it continued with emphasizing of property market as a driver of economic growth and it has further conferred on the impact of URD on industrial property market. Furthermore, it deliberated the increment value of the industrial property buildings along riverfront area based on its location. From the findings, it could be suggested that the impact assessment of the property development (i.e., URD) have to focus more on property market instead of other indicators. It was due to the property market indicator showed huge impact to reflect on URD development. However, the other indicators such as social, demographic, environmental attributes, government policy etc. cannot be simply left behind as it has interconnected with socio-economic growth especially within an urban area.

ACKNOWLEDGEMENTS

The authors impressively appreciate Ministry of Higher Education (MoHE) and Universiti Teknologi Malaysia for finding this research through Universiti Teknologi Malaysia Encouragement Research (UTMER) (Grant number Q.J130000.3852.20J01).

REFERENCES

- Abdullah, K. (2002). Integrated river basin management. Penang, Malaysia: Universiti Sains Malaysia Press.
- Adegoke, O. J. (2014). Critical factors determining rental value of residential property in Ibadan metropolis, Nigeria, *Property Management*.
- Anderson, S. and West, S., E. (2006). Open space, residential property values, and spatial context, *Regional Science and Urban Economics*, 36, 773–789.
- Chadwick, A. and Glasson, J. (2017). Socio-economic impacts 2: Social impacts, Methods of Environmental and Social Impact Assessment.
- Davidson, M. (2009). Urban Geography: Waterfront Development, *International Encyclopedia of Human Geography*, 215–221.
- Davidson, M. (2013). Waterfront Development, *Urban Geography*, March(February), 215–221.
- Gallimore, P., Fletcher, M. and Carter, M. (1996). Modelling the influence of location on value, *Journal of Property Valuation and Investment*.
- Gross, M., Mullin, J. and J. Palmer, (1981). Assessing economic impacts of urban recreation development: Lowell National Historical Park, *Environmental Impact Assessment Review*, 2(2), 159–174.
- Huang, W. -C. and Kao, S. -K. (2014). "Public e private partnerships during waterfront development process : The example of the world exposition, *Ocean & Coastal Management*, 92, 28–39.

- Hui, E. C. M., C. K. Chau, C. K., Pun, L. and Law, M. Y. (2007). Measuring the neighboring and environmental effects on residential property value: Using spatial weighting matrix, *Building and Environment*, 42(6), 2007, 2333–2343.
- Hussein, H. (2009). Urban Recreational Riverfronts : Successful Revitalisation Elements, *Journal of Design and the Built Environment*, 2009, 1–14.
- Iacono, M. and Levinson, D. (2011). Location, Regional Accessibility, and Price Effects: Evidence from Home Sales in Hennepin County, Minnesota, Transportation Research Record: *Journal of the Transportation Research Board*.
- Jones, A. (1998). Issues in Waterfront Regeneration : More Sobering Thoughts-A UK Perspective, *Planning Practice & Research*, 13(4), 433–442.
- King's Lynn Marina Master Plan, (2007).
- Kovacs, K. F. (2012). Integrating property value and local recreation models to value ecosystem services from regional parks, *Landscape and Urban Planning*.
- Miyake, K. K., Maroko, A. R., Grady, K. L., Maantay, J. A. and Arno, P. S. (2011). Not Just a Walk in the Park: Methodological Improvements for Determining Environmental Justice Implications of Park Access in New York City for the Promotion of Physical Activity, *Cities Environment*, 37(12), 1068–1074.
- Nai, S. M. and Sargent, D. (2013). Beyond Natural and Economic Impacts: A Model for Social Impact Assessment of Brownfields Development Programs and a Case Study of Northeast Wilmington, Delaware. Northeast Wilmington, Delaware.
- Nicholls, S. (2001). Measuring the accessibility and equity of public parks : a case study using GIS, *Managing Leisure*, 6, 2001, 201–219.
- Nolon, J., R. (1996). 'The National Land Use Policy Act', *Pace Environmental Law Review*, 13, 519–523.
- Olszak Management Consulting et al. (2012).
- Otto, B., McCormick, K. and Leccese, M. (2004). Ecological Riverfront Design : Restoring Rivers, *Connecting Communities*.
- Saayman, M., Marve, P. V. D., Saayman, A. and Mouton, M. E. (2009). The Socio-economic Impact of an Urban Park: The Case of Wilderness National Park.
- Samaha, S. A. and Kamakura, W. A. (2008). Assessing the market value of real estate property with a geographically weighted stochastic frontier model, *Real Estate Economics*.
- Sasaki Associates, *Three Rivers Park Economic Impact Analysis*. City of Pittsburgh, (2015).
- Smoky Hill River Renewal Master Plan, (2010).
- Stein, R., M. (2001). Hudson River Regional Economic Impact: Impact of Environmental Remediation.
- Streatfield, D. and Markless, S. (2009). What is impact assessment and why is it important?, *Performance Measurement and Metrics*, 10(2), 2009, 134–141.
- Value, E. (2010). Why Parks and Recreation are Essential Public Services, *National Recreation and Park Association*.
- Wallner, R. (2013). GIS Measures of Residential Property Views, *Journal of Real Estate Literature*.
- Zhang, X., Lu, H. and Holt, J. B. (2011). Modeling spatial accessibility to parks : a national study, *International Journal of Health Geographics*, 1–14.

Received: 19th December 2022. Accepted: 19th June 2023