# The Impact of Recurrent Flooding on Residential Property Values and Purchaser Risk Awareness: A Case Study of Shah Alam, Selangor, Malaysia

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## ABSTRACT

This study investigates the impact of flooding on property values and the level of flood-risk awareness among prospective homebuyers in Shah Alam, Selangor. As a rapidly developing urban centre, Shah Alam faces frequent seasonal flooding, which poses a significant challenge to the local real estate market by influencing both asset valuation and residential preferences. Despite ongoing mitigation efforts, the complex relationship between flood incidents, property depreciation, and buyer behaviour remains under-explored. The primary objectives of this research are to analyse the effects of flooding on housing values and to evaluate the awareness of homebuyers regarding flood-prone areas. Adopting a mixed-methods approach, the study utilizes a survey of 70 homebuyers in Shah Alam alongside house buyer preferences and awareness. Findings reveal a high level of risk consciousness: 71.4% of respondents consulted flood-risk maps prior to purchase, and 70% were aware of the flood history of their target areas. Furthermore, 48.6% indicated they would seek expert consultation before committing to a property in a high-risk zone. These results suggest that homebuyers are increasingly proactive in mitigating environmental risks, a trend that carries significant implications for future housing market dynamics and urban policy development.

**Keywords:** Residential Preferences, Flood Risk Awareness, Property Valuation Value

## INTRODUCTION

Flooding represents a critical environmental challenge with profound implications for both macroeconomic stability and the micro-dynamics of the real estate sector. In the context of Malaysia, Shah Alam serves as a primary example of a rapidly urbanizing region increasingly susceptible to hydrological hazards. The escalating frequency and intensity of these events, largely attributed to the synergy between climate change and rapid urban expansion, have become a focal point of concern for policymakers and scholars alike. Recent catastrophic flooding in Selangor has intensified scrutiny regarding the long-term trajectory of property markets in affected zones (Yaasin, Adnan, & Sadek, 2023).

The real estate market's sensitivity to environmental hazards is often reflected in significant capital depreciation. Expert projections suggest that property values in inundated areas of Shah Alam could face a decline of up to 30% (Hwang, 2022). Such forecasts have cultivated a climate of investor "hesitancy," where prospective buyers prioritize capital preservation over the historical prestige of certain locations. While the Selangor State Government has spearheaded recovery initiatives—focusing on infrastructure restoration and debris clearance—the psychological impact of these disasters persists (Zawawi, 2021). Consequently, the recovery of market value remains impeded by an enduring "risk premium" that continues to shadow flood-prone neighbourhoods.

Literature consistently identifies a complex, inverse correlation between flood risk and property pricing. The perceived threat of physical destruction to residential assets triggers a cascade of adverse market effects, primarily driven by diminished demand (Adelekan & Asiyanbi, 2016). According to Perez (2023), properties in high-risk zones experience stagnant or declining valuations compared to their non-flood-prone counterparts.

This discrepancy is fuelled by a triad of concerns: immediate physical safety, the financial burden of escalating insurance premiums, and the long-term uncertainty of asset liquidity (Owusu, 2014; Born & Klein, 2019). Thus, the market value of a home in Shah Alam is increasingly dictated not just by its physical attributes, but by its perceived resilience to environmental shocks.

Beyond direct financial impacts, flooding fundamentally reshapes housing preferences. Individual residential choices are dictated by the interplay of flood frequency, the perceived efficacy of mitigation infrastructure, and the inherent resilience of the local built environment (Ardaya et al., 2017). Prospective residents are increasingly exhibiting a dichotomy in behaviour: while some seek properties equipped with specific flood-resilient architectural features, others opt to exit high-risk markets entirely in Favor of "safety-shielded" neighbourhoods. For urban planners and real estate stakeholders, understanding these shifting preferences is essential for developing robust flood management strategies and ensuring the future viability of the housing market in cities like Shah Alam.

**Problem Statement**

The local residential property market is exposed to a daunting challenge as a result of the recurrent occurrence of flooding in certain places, such as Shah Alam, Malaysia. This challenge has a significant impact on the values of properties and the preferences of individuals about housing. The delicate relationship that exists between floods and the dynamics of the property market is still not well understood, despite the significant efforts that have been made to ameliorate these difficulties. Apprehensions over the future trajectory of the property market have been heightened as a result of recent flooding disasters in Selangor, including regions such as Shah Alam. Experts have expressed their concern regarding the possibility of significant decreases in property values inside flood-affected zones. Nevertheless, the underlying drivers that are responsible for these fluctuations in property values and housing preferences in the midst of flood risks remain largely unexplored. As a result, it is necessary to conduct a comprehensive investigation into the intricate relationship that exists between floods, property market prices, and housing preferences in Shah Alam, Malaysia.

The occurrence of floods in Shah Alam is not an isolated incident but rather a happening that occurs on a regular basis and is intimately connected to seasonal weather patterns, urbanisation, and the difficulties that are associated with infrastructure. As a fast-rising metropolitan centre, Shah Alam is confronted with the simultaneous stresses of population increase and urban expansion, which exacerbates the city's susceptibility to flooding. The effects of these flooding disasters are not limited to the immediate destruction of property; rather, they permeate the very fabric of the local housing market and have an impact on the views and preferences of prospective buyers. Furthermore, the impact of floods on the dynamics of the property market extends beyond the basic monetary losses that they cause. Floods generate a cascade of socioeconomic implications that echo throughout the society. The disruption that is created by floods causes the delicate equilibrium of supply and demand in the property market to be disrupted, which in turn leads to uncertainty and volatility in property values. The result of this is that it can make investments more difficult to make, discourage house buyers, and destroy confidence in the local property market.

Taking all of this into consideration, it becomes an absolute necessity to have a comprehensive awareness of the myriads of elements that influence the dynamics of the property market and the preferences of residents in flood-prone locations such as Shah Alam. The proposed study will be beneficial as it provides policymakers, urban planners, and real estate stakeholders with actionable insights as a result of explaining the fundamental mechanisms that drive the complex interplay between floods, property market prices, and housing choices. The current proposed study aims to addressing the elements that have an impact on the residential property market values in Shah Alam. Besides that, due to current situation in which Shah Alam are prone to flooding, it is important to identify the elements that influence housing preferences. The study will provide information that can be used to inform decisions that are based on evidence and to facilitate the development of targeted strategies for flood management, resilience building, and sustainable urban development in Shah Alam. Indeed, the proposed study will foster a residential property market that is more resilient and vibrant in the face of environmental challenges.

### Objectives

This study investigates the correlation between flood events in Shah Alam, Selangor, and their subsequent impact on residential property valuations and buyer risk awareness. By examining the susceptibility of properties in flood-prone areas, this research provides a critical framework for understanding market volatility following environmental disasters.

The primary aim of this research is synthesized through the following three objectives:

1. To analyse the impact of flooding on residential property valuations within the Shah Alam region.

2. To evaluate the house preferences and the level of flood-risk awareness among homebuyers in flood-prone areas.

The findings offer several practical and academic. For practitioners like real estate agents and valuers, this data serves as a critical tool for assessing market trends and articulating value fluctuations to clients with greater precision. By providing a factual basis for price adjustments, it allows professionals to justify whether a property's value is depreciating or stabilizing based on its specific flood history. Beyond individual transactions, the research offers significant value to the broader industry and policy sectors; by detailing the extent of flood impacts on residential clusters, it provides urban planners and disaster management stakeholders with the insights necessary for more informed decision-making. Finally, the study enriches the academic landscape of environmental economics in Malaysia. It functions as a robust reference for scholars and students, paving the way for future longitudinal studies or comparative analyses focused on the long-term resilience of the property market.

## LITERATURE REVIEW

This study looks at the complex dynamics of floods and their relationships with property values, using Shah Alam as a site-reference. Collectively, based on the rigorous literature review, this study moves from framing how floods are conceptualized to an examination of their varying definitions and connotation within urban space. In addition, this study also takes us on a historical timeline throughout the development of Taman Sri Muda's history which had series of frequent flood disaster that influence its landscape and society structure. This chapter in addition provides a critical evaluation of the previous research efforts that has been made to gain a better understanding regarding the complex association amid flooding and property values. Secondly, this chapter will also outline the major factors influencing residential property market values as it provides a systematic examination of various aspects: from characteristics based on location to infrastructural and environmental issues. This chapter also explores the myriad factors that influence housing preferences in flood-prone areas, shedding light on the socio-economic, demographic, and psychological aspects that shape individuals' residential choices amidst flood risks. By unravelling these factors, this study contributes to a nuanced understanding of the residential property market dynamics in Taman Sri Muda and offers valuable insights for policymakers, urban planners, and real estate stakeholders alike.

### Flood

Flooding is a fundamental natural phenomenon characterized by the rising of water bodies to levels that breach both natural embankments and anthropogenic levee systems, consequently inundating typically dry terrain (Allaby, 2014). This recurrent hydrological process, particularly prevalent along fluvial corridors, underscores the transformative power of natural forces in reshaping physical landscapes and their constituent ecosystems. Under standard conditions, water levels are successfully sequestered within designated boundaries; however, when discharge exceeds the containment capacity of these embankments, extensive overbank flooding occurs.

The spatial and temporal dynamics of flooding are governed by complex interactions between various hydrological and geomorphological factors. According to Zawawi, R. (2021), the amplitude of flooding is influenced by a range of environmental variables, most notably the volume of overflow, flow velocity, and the specific topography of the adjacent terrain. The variety of elements interact synergistically to determine the

intensity and spatial distribution of floodwaters, which directly correlates to the magnitude of damage sustained by affected regions (Cheung, A. M., & Yiu, C. Y. 2022). For instance, steep inclinations can accelerate floodwater velocity, thereby exacerbate erosion and increase flood depth, whereas flat topography facilitates the lateral spread of water over more extensive areas (Mustafa, R.A. 2023).

As a significant natural hazard, the frequency and severity of flooding have been increasingly linked to contemporary global challenges. Hwang, S. (2022) correlated the rising global incidence of extreme weather events, such as intense precipitation and storms, with the overarching impacts of climate change. Furthermore, anthropogenic modifications to land use significantly alter flood development; urbanization and deforestation increase surface runoff while simultaneously reducing soil infiltration. Consequently, the adoption of sustainable land-use strategies is essential for mitigating these risks (Di Baldassarre et al., 2019).

Effective flood risk management necessitates a dual approach incorporating both structural and non-structural interventions. While structural measures—such as levees and barriers—provide immediate protection, they may inadvertently disrupt natural hydrological cycles (Di Baldassarre et al., 2020). Therefore, these must be complemented by non-structural strategies, including early warning systems and strategic land-use planning. As emphasized by Adams, J. K., & Roberts, D. P. (2022), integrating these diverse tactics into a comprehensive flood risk management framework is vital for enhancing societal resilience against the multifaceted nature of flood hazards. Establishing practical mitigation strategies thus requires a profound understanding of the interplay between climatic fluctuations, topographical characteristics, and land-use dynamics to safeguard both human populations and natural ecosystems.

**Property Value**

Within the context of this research, "property values" goes beyond simple financial calculations to encompass the complex web of variables affecting the perceived and actual value of property value (Dagan, 2011). It includes not just the traditional measures of market value but also explores the complex interactions between environmental, infrastructure, and socioeconomic factors that shape the residential landscape. Property values function as a comprehensive representation of the community's sustainability and appeal of residential life within this complex framework. They capture the combination of locational benefits, including being close to services and easily accessible to transit, that make some properties more desirable than others. Furthermore, there is a close relationship between property values and infrastructure advancements, such as the standard of the housing stock, the accessibility of public amenities, and the ability to withstand natural disasters like flooding. Importantly, this study considers the impact of repeated flooding episodes on the value of residential real estate. In addition to the direct physical harm caused by these occurrences, floods have a ripple effect that impacts the housing market, affecting people's perception of risk, insurance costs, and the long-term feasibility of investments. Therefore, property values act as an indicator not only of economic success but also of the community's ability to withstand environmental problems. In essence, within the context of this study, "property values" epitomize the summation of diverse socioeconomic, infrastructural, and environmental factors that converge to define the property landscape of Taman Sri Muda. They serve as a comprehensive gauge of the community's liveability, sustainability, and resilience in navigating the complex terrain of urban living amidst the spectre of recurrent flooding.

**House Buyer Awareness**

Buyer awareness in terms of purchasing property involves understanding various factors that can influence the decision-making process. This includes awareness of environmental and energy efficiency measures, potential risks such as flooding, regulatory frameworks like the Real Estate Regulation Act (RERA), and even collaborative buying platforms. A study on the New Zealand residential property market shows that despite growing awareness of green housing issues, location and price remain the primary factors for buyers (Romali, N. S., & Yusop, Z., 2021). Another study emphasizes the importance of mandatory seller disclosure for flood risk, as voluntary disclosure is often insufficient for buyer awareness (Brown et al., 2023). The introduction of the Real Estate Regulation and Development Act (RERA) in India has been found to increase awareness among buyers about their rights and regulatory measures, though knowledge varies significantly based on demographic factors (Vincent & Vasumathi, 2018). Additionally, buyer coalition platforms like the Awareness-

based Buyer Coalition (ABC) system highlight the role of collaborative knowledge-sharing in the purchasing process (Boongasame & Daneshgar, 2013). Together, these studies underline the multifaceted nature of buyer awareness in property transactions, encompassing environmental, regulatory, and collaborative dimensions.

**History of Flood in Shah Alam**

Environmental projections indicate that climate change will exacerbate hydrological challenges in the coming decades (NFRA, 2011). Despite state-level mitigation efforts, flooding remains an unavoidable natural phenomenon in the Malaysian landscape (NFRA, 2011). As the nation's most devastating natural disaster, flooding is intrinsically linked to Malaysia's geography; of the 189 river basins across the Peninsula, Sabah, and Sarawak, 85 are classified as prone to recurrent inundation. Data from the Department of Irrigation and Drainage (DID, 2009) indicates that flood-affected zones roughly 9% of Malaysia's total landmass—impacting 4.82 million residents, or 22% of the national population. The 1995 flood in Taman Sri Muda, Shah Alam, serves as a critical historical benchmark, with floodwaters exceeding one meter in depth. In response, the state government implemented a localized drainage and catchment strategy designed to channel runoff into the Klang River. The system relies on a network of internal culverts and residential drains that discharge into a primary perimeter irrigation channel. This channel operates via a tidal gate system, during the low tide operations the water is discharged directly into the Klang River through gravity flow. Meanwhile during High Tide Operations, when the river level exceeds the internal channel level, tidal gates are closed to prevent backflow into the township. During these periods, runoff is diverted into a dedicated catchment pond and later mechanically pumped into the river once levels subside (DID, 2009).

The efficacy of this infrastructure has been compromised by subsequent urban expansion, most notably the development of Kota Kemuning. Rainwater from these newer developments was integrated into the pre-existing Taman Sri Muda drainage network—a system originally engineered for a significantly smaller catchment area. This integration has led to hydraulic overloading, where water volumes frequently exceed the design capacity of ponds and channels. Consequently, Taman Sri Muda has inadvertently transitioned into a regional catchment basin. While residents have become accustomed to "nuisance flooding" (reaching knee-level) as of 2019, the underlying systemic vulnerability remains a primary driver of property value fluctuations in the region (Che Ros, F., Tajuddin, N. F. A., Ahmad Tarmizi, Z. I., Rambat, S., Along, N. Z., & Harun, A. N., 2024).

**Effects of Flooding on Property Prices**

The perception of flood-prone areas as high-risk investment environments stems from their inherent vulnerability to physical damage and the long-term unpredictability of restoration costs. This risk profile creates a significant valuation gap; properties situated within flood zones consistently command lower market prices than those in non-affected regions. According to Razali et al. (2021) and Shu et al. (2022**)**, this depreciation is further exacerbated by the "hidden costs" of ownership, specifically inflated maintenance requirements and the necessity for high-premium insurance coverage, both of which diminish the asset's net attractiveness to investors. In Malaysian context, empirical data underscores a sharp decline in market value following flood events. Research by Romali and Yusop (2021) indicates a differentiated impact across geographical landscapes. Urban Residential Properties experienced a substantial value reduction of 18.5%. Rural Properties saw a comparatively lower, yet significant, decrease of 13.6%, this disparity suggests that urban centres—where property density and commercial integration are higher—face greater economic sensitivity to environmental shocks. These findings highlight the critical need for risk-informed valuation practices in Malaysia, as the "flood-risk discount" becomes a permanent fixture in the pricing of both residential and commercial real estate. Higher insurance costs and potential damage dissuade prospective buyers, leading to reduced demand.

The areas prone to floods are commonly seen as risky investments because of their susceptibility to flooding and the resulting consequences. This perception has a substantial impact on property values and the decision-making processes of prospective buyers and investors. Multiple variables contribute to the sense of danger, which in turn affects the market dynamics in places prone to flooding. Properties situated in flood-prone locations are commonly perceived as investments with a high level of risk. This is a consequence of the

possibility of recurring flood occurrences and the subsequent harm they cause. Razali et al. (2021) emphasize that properties located in flood-prone locations have lower values in comparison to those in areas that are not prone to flooding. The apprehension of potential flood damage, along with the expenses associated with repairs and upkeep, results in a diminished perceived worth of these houses. This image is worsened by the increased expenses linked to insuring these homes against flood hazards.

Properties located in flood-prone areas generally incur greater maintenance costs as a result of the frequent need for repairs and ongoing upkeep after flood occurrences. Moreover, the insurance premiums for these homes tend to be higher in cost. This is due to the fact that insurance firms impose higher premiums to account for the elevated likelihood of flood-related losses. These factors contribute to the elevated expenses associated with owning property in flood-prone locations, thereby reducing their market value. According to Razali et al. (2021), the increased expenses are a factor in the decreased perceived worth of properties in these areas. Flood events exert a direct and substantial influence on the market value of residential homes. Ismail et al. (2019) discovered that urban residential properties in Malaysia experience a depreciation of 18.5%, whilst rural properties witness a decline of 13.6% as a result of flooding. The significant devaluation underscores the economic consequences of flooding on property prices. The frequent incidence of floods and the resulting damages discourage potential buyers, further reducing property prices.

The flood damage estimates indicate a substantial influence on the value of urban properties in Malaysia. Romali & Yusop (2021) underscore the substantial predicted annual damage for residential and commercial regions, identifying them as properties with a high risk. The possibility of flood damage and the resulting expenses, such as increased insurance premiums, discourage potential buyers, resulting in decreased demand and lower property values. Smith et al. (2020) have shown that property values in flood prone zones undergo substantial fluctuations. The unpredictability of market fluctuations adds complexity to real estate transactions, posing challenges for buyers and investors in accurately forecasting the future prices of properties over an extended period. The volatile nature of finances requires the implementation of thorough risk management measures to protect investments and stabilise market conditions.

According to Johnson and Lee (2018), flooding has varying effects on property prices in urban and rural locations, which are determined by local conditions and insurance costs. Urban assets encounter distinct problems in comparison to rural properties, including increased population density and infrastructural requirements, which impact their assessment and market attractiveness. The intricacy of the situation highlights the significance of customised flood risk management strategies that specifically target the distinct conditions of each region. Areas prone to floods are commonly seen as risky investments because of their susceptibility to flooding and the resulting consequences. This perception has a substantial impact on property values and the decision-making processes of prospective buyers and investors. Multiple variables contribute to the sense of danger, which in turn affects the market dynamics in places prone to flooding.

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Flooding significantly affects the value of residential properties, especially in Malaysia. Roslan et al. (2019) discovered a substantial decline in residential property values in both urban and rural locations as a direct result of flood occurrences. The depreciation is a consequence of the frequent damage caused by floods, the expensive repairs, and the elevated insurance premiums necessary for houses in these regions. The study highlights that properties located in flood-prone areas have lower value compared to those in non-flood-prone areas, indicating the market's response to the increased risk and related expenses.

Single-family dwellings situated in floodplains generally see a decline in value as a result of the perceived hazard of flooding. According to the Stanford Report (2022), a home worth $500,000 located in a floodplain could have a decrease in value of roughly $10,500, while a $1 million residence could face a devaluation of nearly $21,000. The decrease is considerably more significant when taking into account the incorporation of comprehensive insurance costs, emphasizing the considerable economic hardship linked to owning real estate in flood-prone regions. The enduring impacts of flooding on the real estate market are substantial. Periodic flood occurrences not only result in immediate decreases in property values but also contribute to long-term reductions. The process of property prices returning to their pre-flooding levels can span multiple years, which has a significant impact on the overall stability and desirability of the property market. Recurring dangers and expenditures linked to floods frequently discourage investors and buyers, resulting in decreased demand and diminished property values.

The influence of flooding on the property market is significant and complex. Properties located in flood-prone locations experience substantial devaluation as a result of the perceived hazards and actual damages caused by floods. Efficient urban planning and the development of infrastructure are essential for reducing these hazards and preserving property values. Various studies emphasize the necessity of implementing comprehensive flood control techniques in order to safeguard property investments and guarantee the long-term viability of the property market in areas prone to flooding. Regions susceptible to flooding frequently encounter substantial swings in real estate prices, resulting in serious economic repercussions. The research conducted by Smith et al. (2020) underscores the unpredictability in property values in these areas, emphasising the economic uncertainty that can impact both local economies and individual property owners. The volatility mentioned can arise due to frequent encounters with flood hazards, which can impact the way buyers perceive the market and affect demand.

Johnson, R. L., & Lee, H. S. (2018) conduct a comparative analysis of urban and rural areas after a flood to delve deeper into these processes. The researchers examine the distinct effects of insurance expenses and individuals' risk perceptions on property prices, depending on the geographical area. Urban areas may see bigger decreases in property prices due to increased insurance costs and perceived hazards, whilst rural areas may have more diverse impacts. The existence or nonexistence of flood insurance has a crucial impact in mitigating these effects, potentially stabilising the worth of properties in impacted regions.

## Factor Influencing Housing Preferences

### Structure

Residential structure is defined by the holistic quality and physical attributes of a dwelling, encompassing a diverse array of parameters such as ventilation, built-up area, construction quality, architectural design, and accessibility features. Additional critical determinants include interior layout, natural illumination, building height, electrical infrastructure, fenestration, housing typology, and orientation. These structural attributes significantly modulate consumer behaviour and purchasing decisions within the real estate market (Mang et al., 2020). Empirical evidence consistently demonstrates that the decision-making process for property acquisition is heavily weighted toward these intrinsic characteristics (Lindberg et al., 1987; Pasha & Butt, 1996, as cited in Mang et al., 2020). Consequently, analysing house structure as a primary determinant provides essential insights for prospective homebuyers and market stakeholders.

Housing preferences are profoundly shaped by structural components that directly impact the residents' quality of life. Architectural style and aesthetic design play a pivotal role in this selection process, as individuals are drawn to specific motifs—such as modern, classical, or minimalist—based on personal taste and lifestyle requirements (Zafarmand et al., 2003). Furthermore, research by Harper and Simonsen (2017) indicates that prospective occupants prioritize spatial configuration, specifically regarding the number of bedrooms, bathrooms, and the overall efficiency of the floor plan. For instance, while larger households may prioritize expansive, multi-bedroom layouts, demographic cohorts such as young professionals or "empty-nesters" often exhibit a preference for compact, open-plan designs (Punter, 2017).

Beyond aesthetics, the utilitarian functionality of a construction significantly influences residential desirability. Features such as optimized storage capacity, spatial efficiency, and ergonomically designed kitchens and bathrooms enhance the overall utility of a home (Levit, 2012). Recent scholarship also suggests a growing emphasis on energy-efficient design—including high-performance insulation, sustainable materials, and advanced climate control systems—driven by environmental consciousness and the desire for reduced utility expenditures (Wang et al., 2022). Moreover, the integration of the dwelling with its external environment remains a vital consideration; proximity to green spaces, recreational facilities, and private outdoor areas significantly augments property appeal, particularly for families (Byrne & Sipe, 2010). Ultimately, the convergence of natural lighting, scenic vistas, and privacy considerations remains fundamental to ensuring inhabitant satisfaction and long-term residential comfort.

### Spaces

Living space is comprehensively defined as the functional and recreational areas within a residential property, including the backyard, balcony, vehicular parking, dining areas, gardens, kitchens, living rooms, and storage spaces, as well as the quantitative distribution of bedrooms and bathrooms (Mang et al., 2020). These spatial configurations are critical in addressing the heterogeneous needs and specific requirements of residents. Empirical evidence provided by Mang et al. (2020) suggests that the adequacy and layout of living spaces are primary determinants in the decision-making processes of prospective homebuyers.

Beyond internal spatial utility, the external "surface" or facade of a residential property significantly informs the perceptual and evaluative frameworks of both buyers and tenants. Aesthetic appeal serves as the fundamental point of initial engagement, establishing the baseline for prospective inhabitants' perceptions. A visually compelling exterior, bolstered by meticulously curated landscaping and sophisticated architectural features, can substantially augment the perceived market value of a property while simultaneously increasing its attractiveness to potential occupants (Jim & Chen, 2009).

Materiality also plays a decisive role in housing preferences; the utilization of premium materials and high-quality finishes serves as a proxy for durability, luxury, and exclusivity, thereby appealing to discerning consumers who prioritize craftsmanship and long-term structural integrity. Furthermore, the demand for low-maintenance exteriors—such as vinyl siding or composite materials—reflects a growing preference for convenience and minimized upkeep among certain demographic cohorts (Cort et al., 2022). This is

increasingly coupled with environmental considerations, where the integration of sustainable materials, energy-efficient components, and ecologically sensitive landscaping resonates with environmentally conscious individuals. Ultimately, the confluence of aesthetic design, material selection, maintenance requirements, and environmental sustainability forms a multifaceted influence on residential selection behaviour.

**Finance**

According to Mang et al. (2020), the financial dimension of real estate acquisition encompasses the total liquidity required for property procurement and the intricate fiscal instruments associated with mortgage financing. Key variables within this domain include application and closing costs, the Base Lending Rate (BLR), Developer Interest Bearing Scheme (DIBS), downpayment requirements, and Employees Provident Fund (EPF) withdrawals. Furthermore, transaction costs such as legal fees, loan agreement fees, Sale and Purchase (S&P) agreement fees, stamp duty, and utility deposits significantly impact the total capital outlay (Mang et al., 2020). Previous scholarship underscores those financial criteria—specifically mortgage availability, the Loan-to-Value (LTV) ratio, loan duration, interest rates, and Real Property Gains Tax (RPGT)—are prioritized by homebuyers as they directly determine long-term affordability (Mang et al., 2020).

The financial framework serves as a primary determinant in residential decision-making, as it dictates the perceived cost, value, and accessibility of housing options. The specific terms and availability of mortgage financing fundamentally define the scope of real estate opportunities accessible to prospective purchasers (Braun et al., 2022). Favourable credit conditions, characterized by suppressed interest rates and flexible lending standards, often empower individuals to acquire larger or more premium properties. Conversely, stringent lending requirements or prohibitive interest rates may compel buyers to pivot toward more economical alternatives.

Empirical evidence from Mang et al., (2020) highlights these financing preferences among low-income cohorts in Saudi Arabia, noting a strong reliance on the government's Real Estate Development Fund (REDF), followed closely by cash transactions. Their findings indicate a specific threshold for monthly mortgage repayments, typically ranging from SR1,000 to SR1,500 (US$267 to US$400), illustrating how demographic-specific financial constraints and literacy shape preferences in real estate financing. Ultimately, the interplay between household liquidity and institutional lending behaviour remains a cornerstone of property market dynamics.

**Location**

Extant research by Mang et al., (2020) indicates that the geographical positioning of a residence and its proximity to essential amenities and local attractions are primary drivers of property acquisition decisions. The strategic value of a home is often determined by its accessibility to food courts, governmental departments, grocery outlets, healthcare facilities, libraries, and primary transport corridors. Proximity to recreational parks, educational institutions, retail centres, sports facilities, and employment hubs further solidifies a property's market appeal. Consequently, the locational context is a vital metric for homebuyers seeking long-term utility and capital appreciation. (Kryvobokov, 2007; Thériault, 2003; Kauko, 2007; Kim et al., 2005).

The spatial characteristics of a property profoundly influence housing preferences, fundamentally shaping the perceived desirability and valuation of residential assets. This phenomenon is driven by the convenience of proximity to necessary infrastructure, where the availability of high-quality educational institutions remains a priority for families, while other cohorts may prioritize medical facilities or recreational areas (Schirmer et al., 2014). For instance, Yuan et al. (2020) examined the correlation between housing prices and urban amenities in China, identifying accessibility, scarcity, and environmental quality as significant value determinants. Their findings confirm that the presence of parks, schools, hospitals, and commercial centres positively correlates with increased property premiums.

Furthermore, the scarcity of urban amenities—often a byproduct of high population density—can exacerbate demand and subsequently inflate housing costs (Yuan et al., 2020). The research also highlights that the qualitative aspects of the urban environment, such as the standard of green spaces, cultural infrastructure, and

the robustness of transportation networks, play a critical role in modulating property values. Ultimately, the interplay between locational convenience and the quality of surrounding urban services remains a cornerstone of residential real estate dynamics.

**Neighbourhood**

Neighbourhood characteristics exert a profound influence on residential preferences, functioning as critical determinants in the spatial decision-making process of prospective occupants. This phenomenon is driven by a multifaceted array of variables that collectively enhance the desirability and perceived utility of specific residential zones. Primarily, the proximity to essential infrastructure—including educational institutions, employment hubs, commercial centres, and transit nodes—is of paramount importance, as it optimizes daily logistical efficiency and remains a central consideration in property selection (Mulyano, Rahadi & Amaliah, 2020).

Furthermore, empirical evidence provided by Pérez-Tejera et al. (2022) underscores the significance of safety and security; variables such as suppressed crime rates, adequate street lighting, and visible community policing fundamentally shape perceptions of residential stability, particularly among households with children. This is closely linked to the qualitative standards of local schooling, where families demonstrate a significant propensity to congregate in areas served by prestigious educational establishments to secure superior academic outcomes for their children (Warikoo, 2022). Consequently, the presence of highly-regarded schools often catalyses localized housing demand.

Beyond functional infrastructure, the socio-aesthetic environment of a neighbourhood plays a pivotal role in shaping housing preferences. A robust sense of communal cohesion and ample opportunities for social engagement significantly augment a district's allure. This is further bolstered by the aesthetic quality of the built environment and the integration of green infrastructure; prospective buyers exhibit a marked preference for neighbourhoods characterized by well-maintained thoroughfares, public parks, and abundant vegetation. Moreover, the availability of diverse housing typologies and price points is essential for attracting a broad demographic, thereby fostering socio-economic diversity within the community. Finally, the presence of cultural and recreational assets—such as theatres, museums, and community centres—enhances the intrinsic value of a neighbourhood, appealing specifically to cohorts seeking an intellectually and socially vibrant lifestyle. Collectively, these factors highlight the intricate and multidimensional impact of the neighbourhood context on the selection of a primary residence.

## METHODOLOGY

The study utilizes a mixed-methods methodology, incorporating both quantitative and qualitative methodologies to provide a thorough comprehension of the research problem. The study includes a cross-sectional survey to collect the current thoughts and awareness of house buyers as well as a literature review analysis to investigate the effect of flooding on property values in Shah Alam.

The study area for this research is in the area of Shah Alam. Shah Alam is a city and the administrative centre of Selangor, located in the Petaling District and a small part of the adjacent Klang District. In 2021, Malaysia was shocked by a major flood that hit the in Shah Alam. That year was the worst flood experienced compared to the previous year. Bukit Naga, and Alam Impian, along with Sections 17, 24, 32, and 36, which have been pinpointed due to their recurrent encounters with flooding.

Content analysis is used to gather the data regarding the effect of floods on housing property value. The information will be retrieved from previous journal or case study that relating to market value of effected flood property. Others websites and any information related with will be used to analyse the information. One set of questionnaires have been developed for specific target respondents, with the overarching goal of achieving second research objectives. The questionnaires are strategically designed to investigate the awareness of house buyers and their preferences in Shah Alam towards flood-risk areas. These questionnaires will be distributed randomly across the Shah Alam region focuses on workers age between 18-55, with an envisaged total of 70 respondents to provide insights through their responses.

The city Shah Alam, the administrative centre of Selangor, Malaysia, has experienced significant population expansion throughout the years. In 2024, the city's population is estimated to be 617,149. A significant proportion of the population in Shah Alam falls within the age range of 18-55 years, which is considered the working-age group. This group is crucial for the city's economic well-being as it constitutes the nucleus of the workforce. According to demographic trends in urban areas of Malaysia, it is anticipated that approximately 45% of the population in Shah Alam belongs to this age group. (Population HUB, 2024). The Sample to variable ratio was used in this study, this implies that fifteen to twenty observations per independent variable are strongly advised, despite the fact that a minimum of five respondents must be accounted for each independent variable in the model (Tabachnick and Fidell,1989). The researcher employed this sampling strategy by targeting 70 respondents who is working that can be the home buyers in Shah Alam. The collected data were analysed using Statistic Package for the Social Sciences (SPSS) software, with emphasis on descriptive statistical analysis.

## RESULTS

The analyse impact of flooding on residential property valuations within the Shah Alam region. The transaction of property at flood-prone area in Taman Seri Muda and Seksyen 23, the flood-prone location in Shah Alam.

The transaction data from Taman Sri Muda in Shah Alam and Seksyen 23 in Shah Alam indicates a dynamic real estate market, featuring a diverse range of sales for both residential and commercial properties. Although the area is prone to flooding, the steady number of sales indicates a strong demand that emphasizes the area's attractiveness to different buyers. Firstly, the transaction data comprises a diverse range of property types, including terrace residences and commercial units. The presence of this diversity signifies a broad spectrum of investment prospects, which entice many categories of purchasers, ranging from individual homeowners to commercial investors. The coexistence of residential and business activities indicates that the neighbourhood is not only an attractive place to live but also a thriving commercial centre.

Furthermore, numerous residences are advertised as freehold, a characteristic that greatly boosts their appeal. Freehold houses provide buyers with enduring security and exclusive ownership rights, unburdened by the numerous limitations imposed by leased properties. This feature is likely to add to the continuing interest in the area, as buyers sense long-term value in these investments. The majority of properties in Seksyen 23 are leasehold, with a term of 99 years. This tenure structure is prevalent in numerous residential areas in Malaysia and has an impact on both the market value and the attractiveness to potential buyers. Although leasehold properties do not provide the same advantages of long-term ownership as freehold properties, they still generate considerable demand because of their comparatively lower cost and advantageous location. The sustained level of transactions, notwithstanding environmental concerns, indicates a robust market. The risks connected with floods may be outweighed by factors such as strategic position, affordability, and possibility for future expansion. Buyers and investors seem to acknowledge these advantages, which is leading to a continuous increase in demand. To summarise, the transaction data from Taman Sri Muda and Seksyen 23 reveals intricate patterns in the dynamics of the real estate market. Although the possibility of floods is taken into account, the area's wide range of property options, along with the assurance of owning the land outright, continue to make it attractive. This situation emphasises the complex and diverse characteristics of real estate markets, where environmental difficulties are weighed against economic motivations and future potential.

The house preferences and the awareness of home buyers in Shah Alam towards flood risk area. The substantial proportion of participants who have examined flood risk maps (71.4%) and had knowledge of past instances of flooding (70.0%) indicates that the majority of individuals looking to buy a home in Shah Alam are diligent in assessing the potential for flood hazards before making a property purchase. Having this information is crucial in a location where flooding can cause substantial detrimental effects on houses and livelihoods.

The findings indicate a high degree of awareness among home purchasers regarding flood risks, which is essential for making well-informed selections. Being knowledgeable empowers purchasers to implement essential measures, choose more secure areas, and push for improved infrastructure and flood management

systems. Such a level of consciousness not only brings advantages to individual purchasers but also enhances the overall resilience of the community.

A considerable number of respondents highlighted the significance of seeking advice from a structural engineer or flood risk specialist prior to making a purchasing choice in an area prone to flooding. The data reveals that 42.86% of the participants expressed a neutral stance, whereas 35.71% agreed, and 21.43% strongly agreed. The average score of 4 indicates a widespread agreement on the importance of seeking professional guidance, demonstrating an understanding of the possible dangers and the benefits of expert assistance.

When evaluating the accessibility of outdoor areas, such as gardens or yards, opinions were more evenly dispersed. A total of 35.72% of the participants expressed either a strong disagreement (14.29%) or a disagreement (21.43%) with the notion that outdoor areas have an impact on their decision-making process. In contrast, an additional 35.72% of respondents expressed agreement, with 21.43% indicating agreement and 14.29% indicating strong agreement. Meanwhile, 28.57% of respondents remained indifferent. The average score of 3 demonstrates the equitable distribution, suggesting that while outdoor areas hold significance for certain individuals, others may prioritise alternative variables while acquiring a residence in flood-prone regions.

The significance of having extra storage space or a garage in flood-prone areas was demonstrated by the fact that 28.57% of participants expressed a neutral stance, 25.71% agreed, and 17.14% strongly agreed. Nevertheless, 17.14% expressed their disagreement while 11.43% firmly expressed their disagreement. The average score of 3 indicates that the need for extra storage or garage space is a moderately significant factor for a considerable number of participants.

An important discovery is the inclination of participants to get flood insurance while buying a house. Exactly 32.9% of the respondents agreed, while an additional 32.9% strongly agreed with the idea of investing in flood insurance. Meanwhile, 17.1% expressed disagreement, 10% strongly expressed disagreement, and 7.1% maintained a neutral stance. The average score of 4 indicates a significant preference for buying flood insurance, highlighting the acknowledgment of its significance in reducing financial risks.

When examining the availability of utilities and transport in flood-prone locations, it was found that 37.1% of respondents highly agreed and 25.7% agreed. Conversely, 14.3% expressed disagreement, 10% strongly expressed disagreement, and 12.9% maintained a neutral stance. The average score of 4 suggests a significant inclination towards convenience and accessibility, even in regions susceptible to flooding.

Respondents also considered the proximity to aquatic features such as rivers or lakes. The survey results indicated that 52.9% of respondents strongly agreed and 35.7% agreed, demonstrating a notable preference for residences located in close proximity to bodies of water. Only a small fraction, specifically 5.7%, maintained a neutral stance, whereas 4.3% expressed disagreement, and 1.4% strongly disagreed. The average score of 4 indicates that the visual and recreational advantages of living near water bodies may be more important to many consumers than their fears about flooding.

When evaluating the flood danger in a neighbourhood that has good amenities, it was found that 42.9% of the respondents had a neutral opinion, 25.7% disagreed, and 31.4% strongly disagreed. There was no agreement or significant agreement among the respondents regarding this statement, resulting in a mean score of 2. This is a prudent strategy, suggesting that although facilities are significant, the potential for flooding remains a substantial worry for most people.

Ultimately, there was a significant predisposition towards purchasing property in flood-prone locations, as seen by the general readiness to do so. More precisely, 61.4% of individuals strongly agreed, 24.3% agreed, and 11.4% maintained a neutral stance. Merely 2.9% expressed disagreement, and none of the participants strongly disagreed. The average score of 4 indicates a significant inclination to buy properties in flood-prone regions, maybe influenced by additional criteria like cost, proximity or amenities.

Ultimately, these discoveries offer significant understanding into the determinants that affect property buying choices in regions susceptible to flooding. The research emphasizes the significance of seeking professional advice, the varying opinions on the usefulness of outdoor areas and storage, and a strong preference for purchasing flood insurance and considering amenities and transportation. These insights can assist developers, legislators, and real estate brokers in gaining a deeper understanding of the goals and concerns of prospective house purchasers in flood-prone locations. This, in turn, can facilitate more informed and strategic decision-making processes.

## DISCUSSIONS

The first objective for this study is using qualitative analysis, which obtain from the literature review. Based on the literature review, flooding has a substantial effect on property values, especially in places that are prone to flooding. The sense of risk linked to these regions results in decreased property prices due to the possibility of repeated damage and substantial maintenance expenses. Residential properties located in urban areas in Malaysia might see a devaluation of up to 18.5%, and homes in rural areas may experience a loss of 13.6%. The devaluation is worsened by the fast urban development and insufficient infrastructure planning. Notwithstanding these difficulties, property sales in flood-prone locations such as Taman Sri Muda and Seksyen 23 in Shah Alam continue to be busy due to factors such as advantageous location, affordability, and potential for future development. The allure of freehold estates, which provide extended tenure and stability, heightens the desirability of these regions. In flood-prone areas, it is essential to have efficient urban design, resilient infrastructure, and comprehensive flood control in order to reduce risks and preserve property values. Implementing these steps is crucial for protecting property investments and guaranteeing the enduring stability of the real estate market.

The second objective is using quantitative analysis which is questionnaire that reveals there is now a good level of awareness concerning the risk of floods amongst potential home buyers in Shah Alam, where 71.4% had checked flood risk maps, and 70.0% were aware of previous flooding incidences. Such awareness is crucial for decision-making. Meanwhile, for close to half of those surveyed, individuals have shown an intention to seek professional advice from structural engineers or flood risk experts before expressing any interest in property in areas prone to flooding. Issues relating to the availability of garden and garage space, as well as additional storage, are also significant issues surrounding the acquisition of such homes in the region.

## RECOMMENDATION

Results of the study have also availed the chance to make some recommendations, which are as follows:

### Public Awareness

Sensitize the general public with an intense campaign of public education about the presence and the possible flooding and improve the accessibility of the level of the risk flood maps to be available. This will give the potential buyers the capability of making better decisions and preventing the underestimation of property in flood-prone areas.

### Government Interventions

There should be strong flood management by improving drainage systems, building storm barriers, and installing early warning systems. Government transparency is essential in creating public trust and providing proper property assessment.

### Flood Mitigation Incentives

To help reduce the risk of flooding, give homeowners grants and lower-cost flood insurance premiums. This will encourage them to invest in flood-resistant steps like flood proofing their homes. Such incentives are required to keep property prices stable and to promote community stability.

**Consultation with Professionals**

Consult with relevant structural engineers and flood risk specialists to help potential buyers make informed decisions on their investment in the chosen homes. It shall maximize the practice of minimizing risks and secure investment.

**Recommendation for Future Research**

This study's findings and conclusions provide numerous recommendations for future research to enhance comprehension of the effects of floods on property values and the behaviour of prospective home buyers in flood-prone regions such as Shah Alam.

Future study should incorporate longitudinal studies to monitor the temporal fluctuations in property values in flood-prone regions. Conducting this analysis would yield a more thorough understanding of the long-term effects of floods on property values and facilitate the identification of trends and patterns that may be overlooked by shorter-term investigations.

Other than that, there is a need for a more comprehensive investigation of the behaviour of home buyers residing in areas that are prone to flooding. One approach could involve doing a more comprehensive analysis of psychological aspects, risk perception, and decision-making processes to gain a deeper understanding of their impact on purchasing decisions.

Next is conducting comparison research between locations that are prone to flooding and places that are not prone to flooding can provide insights into the specific effects of flooding on property values and buyer behavior. This could also aid in discovering optimal methodologies from regions that are not susceptible to flooding, which can be modified to reduce the likelihood of flood hazards. By implementing these suggestions, future studies can generate a comprehensive comprehension of the intricate relationships among floods, property values, and buyer behaviour. This will ultimately aid in enhancing flood risk management and promoting resilient urban development.

## CONCLUSSION

In summary, this research underscores the profound impact of flooding on residential property valuations in Shah Alam. The market reflects a clear "flood-risk discount," where properties in vulnerable zones are consistently undervalued due to heightened risk perceptions. This depreciation is driven by a combination of increased maintenance requirements, escalating insurance costs, and a growing public consciousness regarding environmental hazards. The study’s findings indicate that flooding affects the market through three primary channels:

1. **Financial Depreciation:** A direct reduction in transaction prices and market demand.

2. **Risk Perception:** The classification of flood-prone areas as high-risk investments, which deters long-term capital commitment.

3. **Seasonal Volatility:** The recurring nature of flood events, which prevents price recovery and undermines community stability.

Quantitative analysis reveals that modern homebuyers in Shah Alam are increasingly sophisticated and risk-averse. A significant majority now utilize flood-risk mapping and professional consultations as part of their due diligence process. However, the study also notes a complex trade-off in buyer behaviour, where environmental risks are weighed against lifestyle requirements, such as spatial utility and outdoor amenities. Ultimately, the implementation of the proposed mitigation strategies is essential for stabilizing the Shah Alam property market. By enhancing flood management frameworks and fostering transparency, stakeholders can improve the resilience of affected neighborhoods, ensuring more informed purchasing decisions and long-term market stability.

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