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BUFFER ZONE POLICY AND ITS IMPACT ON THE LAND VALUE AND THE QUALITY OF THE BUILT ENVIRONMENT IN WORLD HERITAGE SITES: THE CASE OF KAMPUNG JAWA, MELAKA, MALAYSIA

Seyed Mohammad Mousavi[1], Shariyeh Hosseininasab[2], Waqas Ahmed Mahar[3,4]*

[1] Department of Architectural Engineering, Faculty of Art and Architecture, Persian Gulf University, Bushehr, Iran
[2] Department of Architecture, COMSATS University Islamabad (CUI), Lahore Campus, Lahore, Pakistan
[3] Department of Architecture, Faculty of Architecture and Town Planning, Aror University of Art, Architecture, Design and Heritage, Sukkur, Pakistan
[4] Sustainable Building Design (SBD) Lab, Department of Urban and Environmental Engineering (UEE), Faculty of Applied Sciences, Université de Liège, Liège, Belgium

*Corresponding author's e-mail: architectwaqas@hotmail.com

Abstract

Introduction: Buffer zones in the context of World Heritage sites play an important role in protecting historic monuments and buildings, as well as their adjacent conservation areas, from disruptions caused by urban development. However, properties within the boundaries of buffer zones may be subject to legislative limitations and restricted construction regulations. This may affect the market value of these properties and make them unfavorable for public and private investors. **Purpose of the study:** The study aims to critically analyze the impact of buffer zone policy on urban development, specifically on the land value and the quality of the built environment in the context of World Heritage sites. The case study for this research is Kampung Jawa (KJ) in the World Heritage City of Melaka, Malaysia. **Methods:** A combination of qualitative and quantitative methods was used to conduct this research. The required data was gathered through direct observations, semi-structured and informal interviews with stakeholders and local authorities, as well as a review of available statistical data and maps. A site observation and a questionnaire survey were conducted to examine all the structures in KJ. **Results:** The research findings revealed that the low land value of buffer zones might be caused by several context-specific conditions, eventually turning them into greyfields. The research recommends a design solution for the area. The research also suggests that certain decisions at the policy-making level, including the involvement of all stakeholders, can be the key to improving the land value and property market within buffer zones.

Keywords: buffer zone; World Heritage sites; land value; grey field; Malaysia.

Introduction

A buffer zone is an impartial area located between two states, serving to separate them in order to protect each other from the other's opposing forces (Martin and Piatti, 2008; Pendlebury et al., 2009; thefreedictionary.com, 2014). In general, the main function of buffer zones is to protect the core zone from external disturbances. This protection should be in line with the improvement of the area, as well as the benefits for the local population (Münch et al., 2016). The purpose of a buffer zone is both normative and technical (Martin and Piatti, 2008). The protection of buffer zones not only takes into account the "structural and technical" issues of historic environments but also protects their "functional" and "visual" aspects (Habibi et al., 2015; Martin and Piatti, 2008; Moradi et al., 2014).

In controlling the transition between the heightened protection of World Heritage sites and the surrounding territories, a buffer zone may set limits to protect views, settings, land uses, and other aspects, but may also positively encourage developments that would be beneficial to the site and the community (Daneshmandian et al., 2020; National Trust and English Heritage, 2011). Neumann (1997) mentions some examples in various locations where the creation of buffer zones leads to new state limitations and interventions in land use. These legislative limitations may reduce property demand and make buffer zones unattractive for investors, as they would prefer to invest in surrounding modern areas with fewer building restrictions and higher profits. This may cause buffer zones to remain underdeveloped and fail to respond to market demands, while redevelopments are quickly taking place in the surrounding areas. These underdeveloped areas lead to the emergence of grey fields, which decrease the potential land value of buffer zones. The grey fields located in the buffer zones of World Heritage sites have more specific potential compared to the

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physical properties that other grey fields may have. This research takes KJ in Melaka, Malaysia, as a case study to investigate the potential impacts of buffer zone policy on the land value in the context of World Heritage sites. It attempts to address the consequences of changes in the land value for the condition of the built environment in this area.

Literature Review

In the context of World Heritage sites, a buffer zone generally acts as a support area around the heritage properties by providing an additional layer of protection. The primary objective is twofold: first, to ensure the conservation of the protected area by regulating undesirable or damaging influences; second, to support necessary protective measures while maintaining the progressive interface of the core zone with the adjacent zone. It is therefore anticipated that a buffer zone provides a context for heritage governance by incorporating the surrounding landscape with the core zone (Palaiologou and Griffiths, 2019; Schlee, 2017).

Therefore, a buffer zone is an area surrounding the nominated property that has complementary legal and/or customary restrictions placed on its use and development in order to give an added layer of protection to the property (UNESCO, 2019). The definition of a buffer zone in the context of World Heritage sites has evolved from its original form in 1977 to the most recent one outlined in the 2019 version of the Operational Guidelines for the Implementation of the World Heritage Convention (UNESCO, 2008). Before 1990, buffer zones were only considered as the inner strips of a protected core zone situated next to the boundaries that might result in disconnecting the property from its surroundings. Peripheral zones encompassing areas located immediately outside the boundaries were the redefinition of such zones in 1993 (Gilmour and Van San, 1999).

In policy and practice, however, implementing the buffer zone theory has several impacts on area development and the life of the local community. According to Wells and Brandon (1993), the main function of buffer zones is to protect core zones, while generating profits for local people is of secondary importance. Furthermore, many researchers have noted the failure of buffer zones in numerous projects, as they did not plan to buffer the core zone in order to enhance local livelihoods (Martino, 2001). Based on various definitions of buffer zones, they suggest constraints on the land use distribution of such areas (Neumann, 1997). Additionally, some implications of buffer zone policy represent restrictions on certain human activities within the area (Meffe and Carroll, 1994). Numerous studies have tested the efficacy of buffer zones; however, most of them focus on the ecological buffering functions in comparison with the socioeconomic ones (Heinen and Mehta, 2000). Nonetheless, the best description for a buffer zone suggests that the area should create mutual support between the conservation area and benefits for the local community (Habibi et al., 2015; Short, 2012; Tavernor, 2007).

In the context of World Heritage properties, buffer zones are delineated areas at the periphery of the core zone that contribute to the preservation, management, integrity, and sustainability of the World Heritage area with regard to its Outstanding Universal Value (OUV) (Martin and Piatti, 2008). Buffer zones are intended to simultaneously reduce individual impacts on conservation areas and address the socioeconomic demands of the affected people (Ahmad et al., 2012). However, buffer zones can help establish a significant system that contributes to the benefits of World Heritage sites for stakeholders and local communities, in order to develop a sustainable network (UNESCO, 2011). Buffer zones should be considered as integral parts of the state party's commitment to the protection and management of the World Heritage sites, as effective management and protection are essential requirements for World Heritage properties. Nonetheless, buffer zone policy is only one of the tools to ensure the management and protection of heritage sites. While the fundamental features of buffer zones are common for cultural, natural, and mixed properties, the implementation of buffer zones would be different for each specific property (Martin and Piatti, 2008). A buffer zone is not just a secondary zone meant to support a primary zone, but rather an equal, complementary, and inseparable part of the core zone. This statement reinforces the idea that planning the conditions and boundaries of inscribed zones, buffer zones, and even tertiary zones must be designed in tandem. In addition to visual and physical characteristics, buffer zones also interact with the natural environment, traditions, local knowledge, moral or social aspects from both the past and present, informal activities, and other intangible attributes of cultural heritage environments (Martin and Piatti, 2008).

KJ as the Most Significant Part of the Buffer Zone in Melaka

Malaysia has many heritage sites, most of which have buffer zones around them. Melaka, located in southwest Malaysia, was recognized as a World Heritage city by UNESCO in 2008 due to its OUV (Mohd-Isa et al., 2011). For this research, Kampung Jawa (KJ) in Melaka was considered as a case study after shortlisting six other heritage sites in Malaysia. The purpose of this study was to review the impact of the buffer zone policy on the land value and, consequently, the quality of the built environment in the area. All the shortlisted cases were selected based on specific criteria, including being a significant heritage site, the implementation of buffer zone policy on the site, and being affected

by buffer zone policy over time (Fig. 1a). After reviewing the shortlisted cases and conducting initial field surveys, it was determined that KJ best met the specified criteria. Furthermore, the team found it more convenient to gather data in the KJ case due to the easy accessibility of the site.

KJ is located in the buffer zone of the historic city of Melaka, encompassing an area of 6.5 acres on the northern bank of the Melaka River, known as the origin of urban development for Melaka city (Wahid et al., 2011). It is bounded by Kee Ann and Pasar Baru streets. Bunga Raya Street is a significant local trading area located in the eastern part of KJ. The history of KJ can be traced back to the beginning of the Melaka Sultanate around the 15th century. In fact, it was a settlement site for fishermen, particularly traders from Java (Liang, 1983). Before 1988, KJ was a dynamic area with a variety of activities, including a traditional bazaar, a municipal market, and various types of informal activities. However, KJ's condition deteriorated after the collapse of the municipal market in 1988. Similarly, local traditional businesses, especially bazaars and vendor activities, were affected and consequently declined. Furthermore, the role of the Melaka River as the main transportation hub and river activities have decreased over the years. In addition, a few setbacks, including the relocation of taxi and bus stations far away from the new site, deteriorated KJ's status. The depopulation of the area increased when the local inhabitants left KJ after two fire disasters, one in the 1960s and the other in the 1990s (Wahid et al., 2011). As a result, KJ was transformed into a residential slum area (Fig. 1b). Meanwhile, the construction of large new commercial buildings outside of KJ significantly decreased the site's economy. While there are some lively activities within the site, their unfavorable condition cannot compete with the new commercial developments in nearby areas. Therefore, despite being in a strategic area, KJ is now underdeveloped and suffering from a low-density built environment compared to its neighboring districts. The combination of the above-mentioned facts turned KJ into a grey field.

Given the historical and socioeconomic significance of this area, there is a need to restore the site's importance and develop its potential by identifying significant factors that can enhance the land value of this historic area of the city through sustainable urban approaches.

Methods

In order to create a successful revitalization approach in grey fields within buffer zones, it is important to determine the significant contributing factors that affect the growth and decline of the land value in the context of the urban fabric, which ultimately affects the spatial quality of the environment. After reviewing the available literature and considering the situation and context requirements, five factors were identified for this study: built and unbuilt area ratio, density, land use distribution, quality of existing buildings and structures, social vitality, and active frontage of buildings. The data was collected through available documents and statistics, GIS maps, field surveys, site observation, and interviews. The observation was conducted by going door to door, recording events on-site, and documenting building properties that were significant in contributing to the land value and spatial quality of the area. After mapping the collected data, the next step was to interview local residents and members of the community who worked and lived on the site. The goal was to identify the strengths, opportunities, weaknesses, and threats of the site from the stakeholders' points of view. Furthermore, a survey of individual buildings was conducted based on identified factors and plot ratio, and data was collected from local authorities. This data was used to triangulate a synthesized map showing land values. Later, local authorities

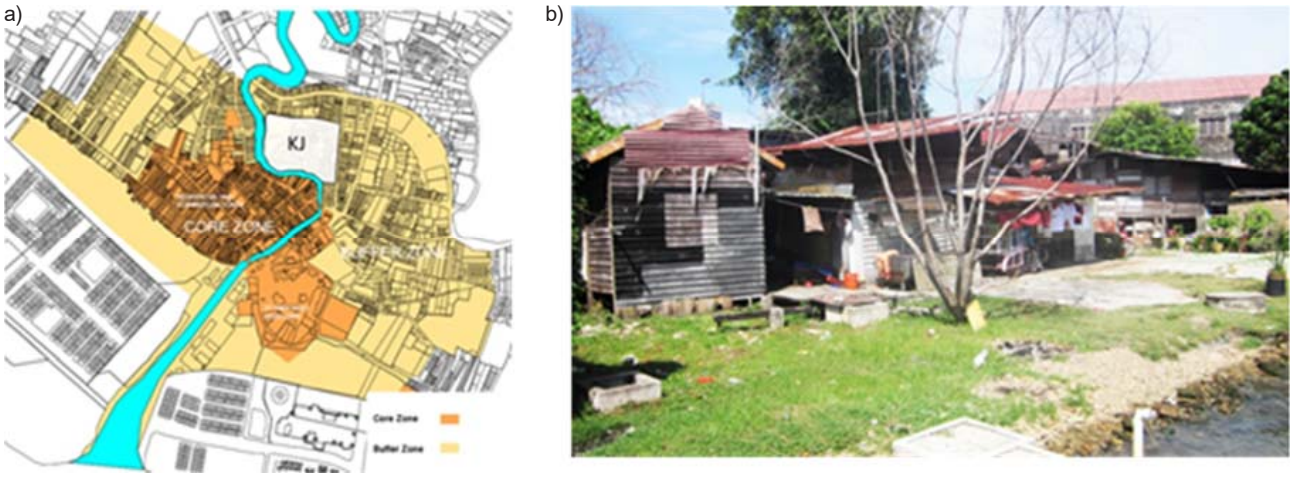

Fig. 1: a) location of KJ in Melaka, b) KJ as a residential slum area

were interviewed about the land value of plots, and the area was mapped once more to validate the previous findings. The analysis and processing of the data resulted in the development of a final map of the area, which divided the available buildings and structures on the site into two categories: retainable and non-retainable buildings. This provided insight into the spatial quality of the area and helped to formulate a proposal for future development of the area. Fig. 2 depicts the methodological framework of this study.

Results

The first factor that was surveyed was the 'built and unbuilt area ratio' in KJ. Fig. 3a shows a solid and void map of KJ. According to these maps, there are numerous disorganized vacant lots, open spaces with undefined functions, and unused parking lots on the site. These neglected lands have tarnished the image of this important district, turning it into a dormant, quiet, and unsafe area. As can be seen from the number of building stories (density map) (Fig. 3b), most of the structures in KJ are single-story buildings. However, throughout its periphery, especially in the new surrounding developments, there is a wide range of building heights, all of which have a higher density.

Fig. 4a demonstrates the land use distribution. Almost all commercial buildings are located on Bunga Raya (eastern part) and Kee Ann streets. The percentage of vacant buildings and storage areas in KJ is higher compared to its neighboring areas. In addition, residential houses (detached or bungalows) are the main types of properties in KJ. According to the building quality map, the majority of the residential buildings on the site are in a deteriorated condition. The building quality was assessed based on the structure's quality, the current condition of the facades, and the architectural style of the existing buildings, which could to some extent indicate the durability and timeline of the buildings. The building quality map illustrates the quality of the existing buildings on the site. Based on the map, building quality was categorized into three groups: good, medium, and poor. Generally, most of the buildings in KJ have poor structural conditions, and the rundown condition of their facades and appearance has reduced some of them to abandoned houses (Fig. 4b).

Fig. 5a reveals the building styles in terms of architecture. As mentioned, this factor was used as a supporting criterion to evaluate the building quality, as it would indicate the durability and material quality of the existing buildings. Three building styles were chosen for the site: vernacular/traditional, modern, and buildings with no architectural significance. The latter indicates buildings with temporary materials,

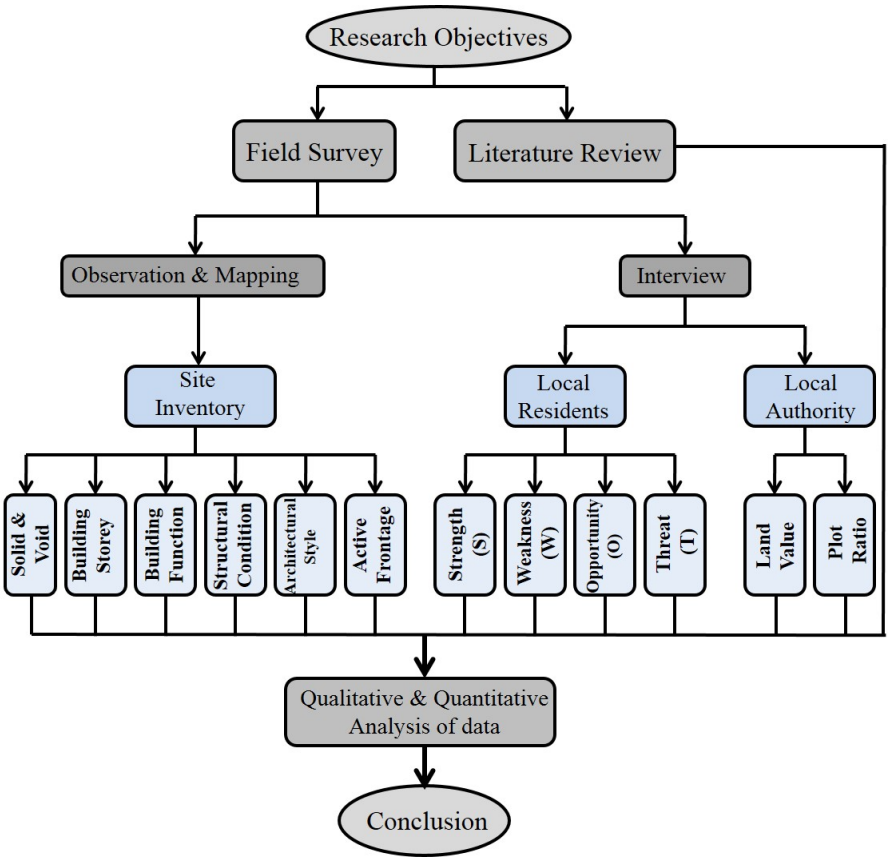

Fig. 2. Methodological framework

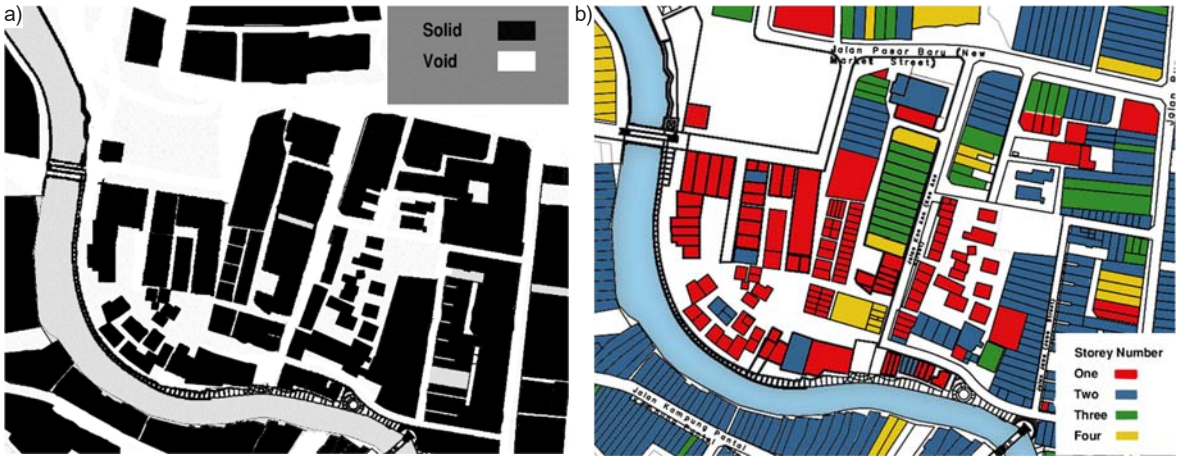

Fig. 3: a) solid & void map, b) density map

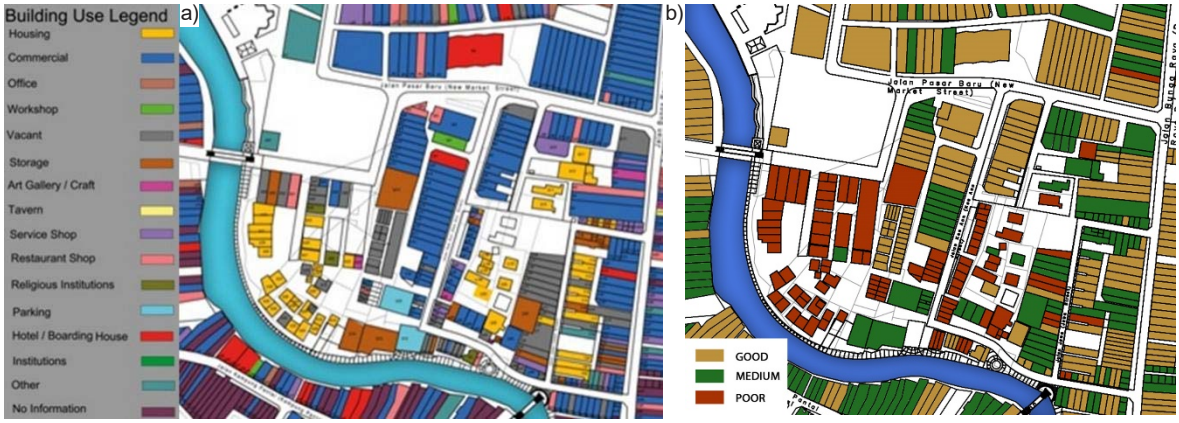

Fig. 4: a) land use distribution map, b) building quality map

such as wood and bamboo, which are not long-lasting structures. Buildings with active frontage have transparent and interactive facades that can create interaction between passersby and activities taking place within the buildings. In contrast, buildings with inactive frontage lack this quality and, therefore, do not contribute to creating vitality and social life in the area. This will have an impact on the retail business and, eventually, the economic prosperity of the area. While most buildings on Keep Ann and Bunga Raya streets benefit from active frontage due to their location in a popular commercial area, the concentration of storage areas, vacant buildings, and parking lots create many inactive building frontages in KJ (Fig. 5b).

Triangulation by Local Residents

An interview including open-ended questions was conducted with members of the local community who live, work, and visit KJ. They were asked questions about the strengths, opportunities, weaknesses, and threats of KJ based on five points, as well as the plot ratio. Most respondents declared that they preferred KJ due to its friendly shopping atmosphere. There is a wide range of affordable and unique merchandise, such as bridal accessories, school uniforms, medicine, and various kinds of clothes, as well as general comfort for daily shopping. Therefore, more than half of the respondents shared the same opinion that shopping was their top priority when visiting this district. As a result, river activities also attracted the highest number of respondents (about 18 %). In conclusion, it is easy to understand that retail shopping activity was the greatest strength of this underdeveloped site (Fig. 6a). Additionally, nearly all respondents declared that five common weaknesses of the site include a lack of urban amenities within the site, an unsafe walking environment, especially at night, run-down structures, a lack of public transportation (relocation of the bus station to another site), and the migration of locals to other districts leading to the depopulation of KJ. Among the main weaknesses of KJ, run-down structures received the most attention from the participants. In second place were the inadequate and unsatisfactory urban amenities (Fig. 6b).

The informal interview with the locals of KJ demonstrated that they identified five main opportunities at the site. These opportunities include the Melaka River as a significant element within the site, a traditional bazaar offering a wide range of affordable products, existing hawkers and

Fig. 5: a) architectural style of the buildings, b) active frontage of the buildings

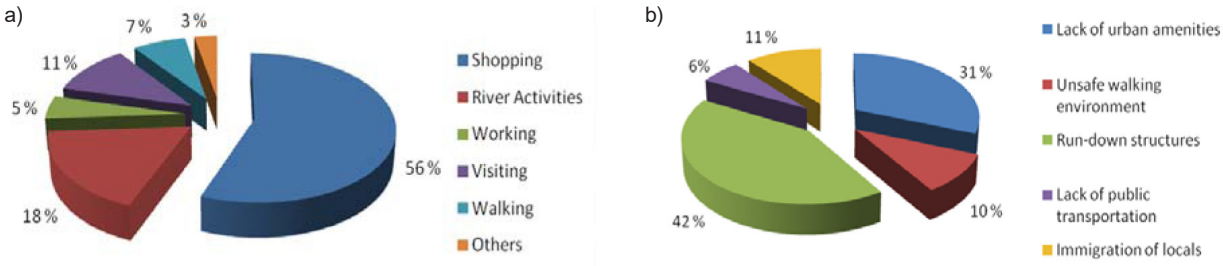

Fig. 6: a) strengths of KJ, b) weaknesses of KJ

vendors engaging in informal activities throughout the site, rows of shophouses, and the proximity of KJ to the World Heritage site (core zone). According to Fig. 7a, a traditional bazaar is considered the primary opportunity. Nevertheless, the majority of respondents chose commercial activities as an essential opportunity. These commercial services included bazaar lanes, hawker and vendor activities, and shophouses, which together accounted for 64 % of responses. The final part pertained to those participants who were residents of KJ. They explained the major factors that endangered the site. Most of them (about 52 %) expressed concerns about the local community migrating to other parts of the city, which was seen as the most serious threat. This resulted in the reduction of residential houses on the site and its transformation into a primarily commercial area. The other notable threat was shopping activities, both formal (bazaar) and informal (hawkers and vendors), which accounted for 26 % and 19 % of responses, respectively (Fig. 7b). Such activities typically have their disadvantages on the site, including pollution, an increase in traffic, and a lack of safety for the residents.

Validations by Local Authorities

Permissible land use, plot ratio, and building density are significant factors that should be considered in land-use planning. These main issues may set limits for how much can be built and what can be built (Christensen, 2014). In particular, within the World Heritage buffer zones, certain legislative restrictions, such as limited plot ratio and compatible land use, must be adhered to. Through interviews (using open-ended questions) with local authorities, the permissible plot ratio for the lots was identified. According to the municipal authority's plans, the core zone of Melaka has a plot ratio (PR) of 2.5:1 and the buffer zone has a PR of 3.5:1. Thus, it can be concluded that the optimal plot ratio in the core zone is PR ≤ 2.5, while in the buffer zone it is 1 < PR ≤ 3.5. Consequently, the non-optimal plot ratio in the core zone is PR > 2.5, while in the buffer zone, it is PR > 3.5 or PR ≤ 1 (Fig. 8a).

To validate the previous data obtained from direct observation and site inventory in terms of five factors and plot ratio, the land value of the lots in KJ was obtained through interviews with local authorities. The approximate land value in KJ was revealed to be between RM 500 (USD 120.9) and RM 1,500 (USD 362.8) per square meter, and RM 2,719 (USD 657.6) per square meter for Kee Ann Street. Moreover, Bunga Raya Street (the main commercial road that borders the eastern part of KJ) had the highest land value, ranging from RM 3,130 (USD 756.9) to RM 4,023 (USD 972.9) per square meter, in comparison with the other commercial streets. In other words,

the land value was 68.8 % higher compared to the inner part of KJ (Fig. 8b).

Discussion

After validating and cross-analyzing the obtained data, the following facts were revealed:

- A high percentage of the area is covered with vacant land, abandoned lots, undefined open spaces, large on-street parking lots, and single-story buildings. This results in the low massing of the main part of KJ, which hinders the connectivity of the buffer zone to the core zone. Moreover, it disrupts the image of the district and transforms it into a dormant, quiet, and unsafe area.
- Despite the high potential of the land in this strategic location, the land use distribution is not compatible. This results in an unsafe area with the lowest level of vibrancy.
- There are many inactive spaces, that decrease the liveliness and vitality of the area, with numerous vacant buildings and warehouse areas in KJ. However, there is a high concentration of pedestrians on its adjacent streets (Bunga Raya and Kee Ann).
- The presence of temporary and run-down structures, along with a lack of lively activities, has turned the residential area facing the Melaka River into a slum area. In addition, these residential houses do not have the optimal plot ratio.

By overlaying the aforementioned maps (land use distribution, density, building condition, vitality, active frontage, solid and void, and plot ratio), and triangulating with local residents' opinions, the buildings were categorized into two groups: retainable and non-retainable buildings. Retainable buildings are those with acceptable structural conditions, functional activity, and high architectural and heritage value. Non-retainable buildings consist of structures in poor condition that are functionally inactive and lack architectural and heritage value. In addition, buildings with acceptable structural conditions that were vacant or used for commercial purposes have also been included in this group (Fig. 9a). After validating and synthesizing the data with local authorities, it was concluded that nearly all non-retainable buildings in KJ had the lowest land value.

It can be stated that the buildings in this part of the buffer zone have run-down structures and incompatible building functions, despite being in a valuable part of the buffer zone, lacking any architectural significance. Most of the buildings in KJ should be demolished due to the high potential for redevelopment as a key part of the buffer zone. Fig. 9b illustrates the site after the removal of inadequate structures.

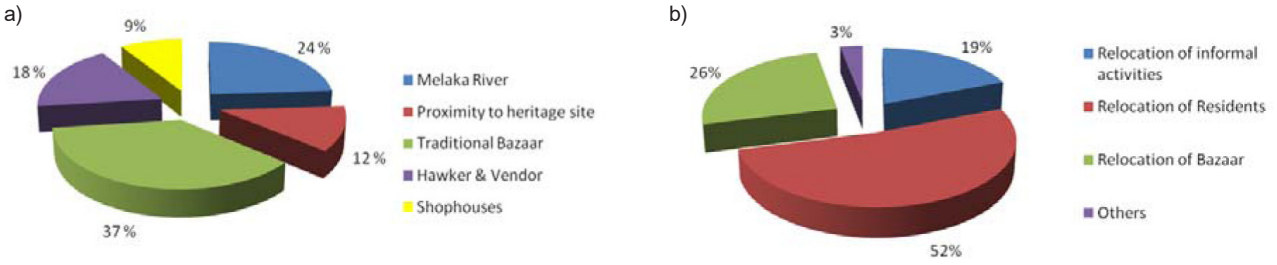

Fig. 7: a) opportunities in KJ, b) threats in KJ

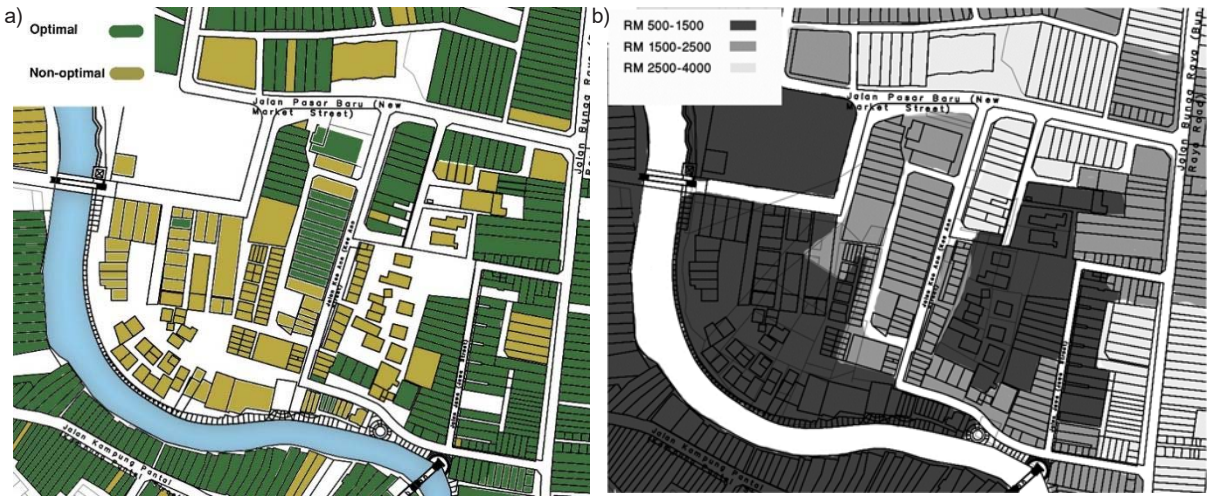

Fig. 8: a) plot ratio map, b) land value map

Potential Design Proposals for Redevelopment

At this stage, proposals to increase the land value can be directly based on the aforementioned five factors and the plot ratio. There are endless possibilities for combining these factors to develop various methods of increasing land value. One conceptual diagram is shown below (Fig. 10).

The following shows some of these combinations:

Compatible building function: Improving the imbalanced status of KJ by introducing mixed-use development, including residential, social activities, and commercial uses within the site.

Active frontage: Relocating and replacing buildings such as warehouses and wholesale outlets with various vibrant land uses that have more transparent frontage in order to enliven the site.

Optimal building height and plot ratio: Introducing mid-rise buildings on the site instead of the existing single-story buildings to achieve the optimal plot ratio and high density on the site.

Adequate solid and void ratio: Creating enough open spaces with specific functions (such as parks, greenery, plazas, and parking) instead of having large vacant lands. It also includes connecting these spaces to enhance visual and physical accessibility.

The proposed master plan includes various social activities in public open spaces, pedestrian connections, commercial or mixed-use developments, entertainment, local handicraft displays, and street vendors or hawkers in a critical attempt to revive the local spirit of the place as well as the historical identity of this site (Fig. 11a). While all the new developments have been focused on the existing Melaka historical riverfront, architectural character, skyline, visual qualities, and cultural traditions, they have also provided significant benefits for the local population. Fig. 11b depicts the status of KJ before and after the revitalization development. As can be seen, KJ has low density, vast and empty lands, dilapidated and slum structures, unappealing views, mono-functional and single-story buildings, disorganized linkages, and weak connections with other parts of Melaka. Undoubtedly, after development, it will have high density, defined open spaces with various functions, multi-functional buildings, mixed-use structures, pleasant visual and physical permeability, walkable and vibrant public

Fig. 9: a) status of structures after analysis, b) KJ after removal of dilapidated structures

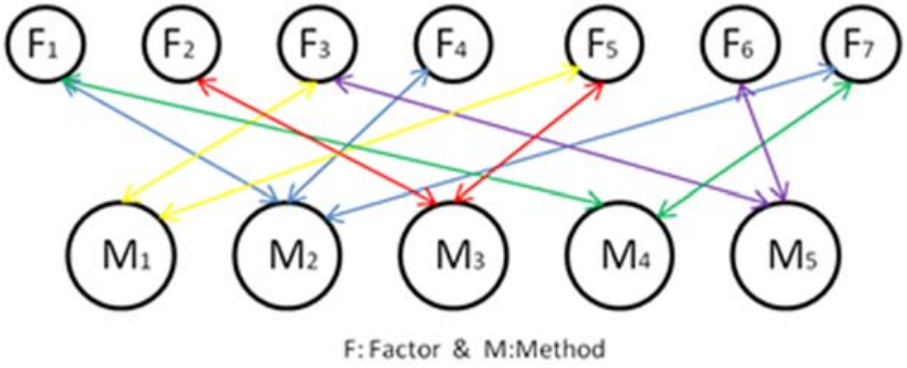

Fig. 10. Conceptual diagram illustrating the interaction between factors and methods

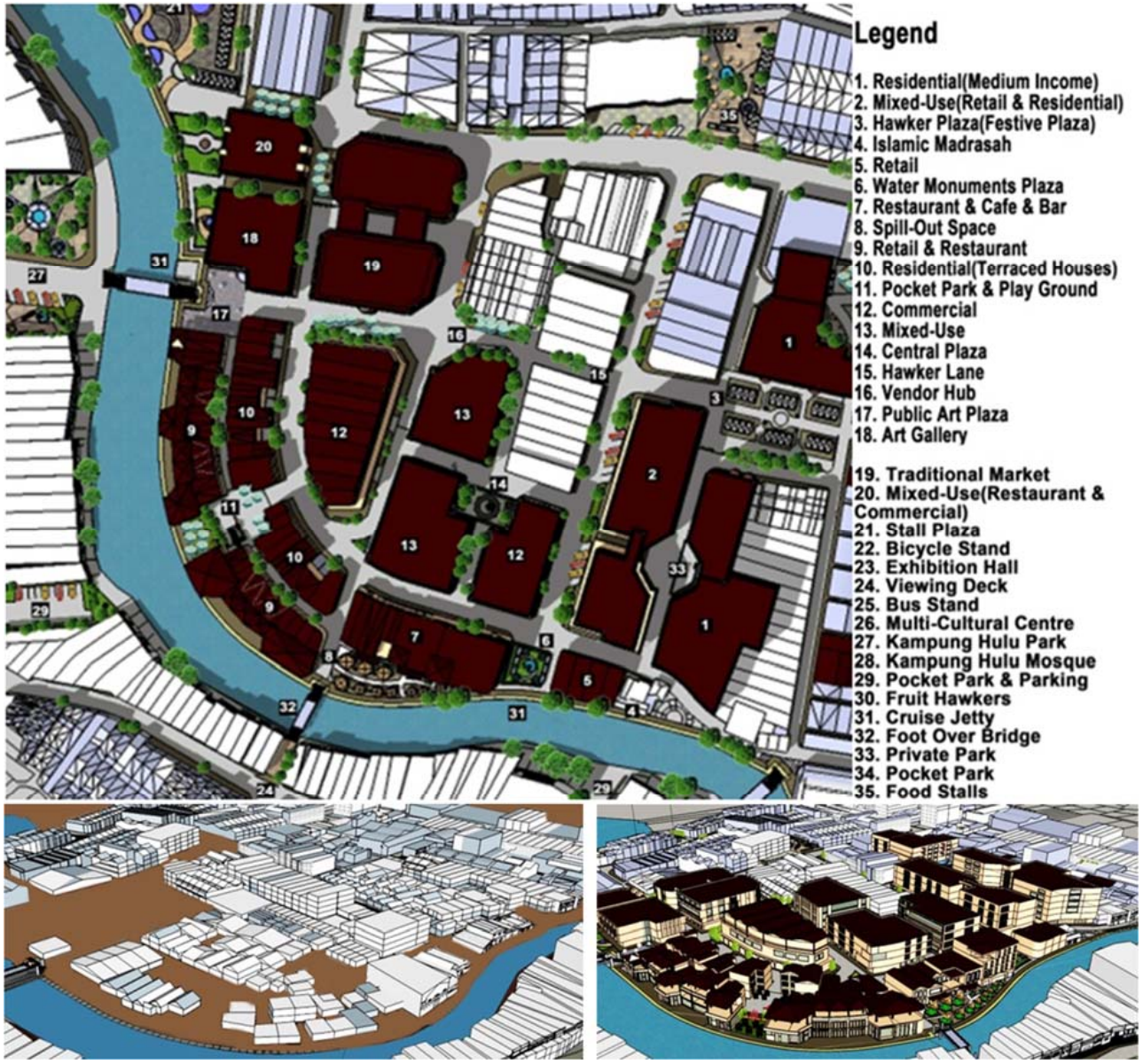

Fig. 11: a) master plan, b) before and after revitalization

areas full of social activities, optimum plot ratio, diversity, legibility, and robustness.

Conclusions and Recommendations

KJ is an underdeveloped area due to the regulatory restrictions of the buffer zone policy, and, as a result, it has the lowest land value compared to its adjacent districts. This has led to the existence of undeveloped vacant lands, incompatible land use, slum areas, dilapidated buildings, and inadequate provision of urban amenities on the site. The revitalization approach in this study was conducted based on the participation of three stakeholders: the local community, visitors, and the government (local authorities). The participation of local authorities and residents, in addition to the perspective of visitors, is key to revitalizing the land value of high-potential districts within historical buffer zones (Fig. 12).

Low land value is considered a serious threat because it implies a low willingness of people to invest in buffer zones. This results in a decrease in market demand, as they are interested in investing in the new areas of the city. Sustainable development should be based on a harmonious relationship between the existing built forms in the historic core zone and new proposals for the buffer zone. Finally, the urban revitalization approaches in this study can increase the current land value, improve the locals' living standards, and generate profits for the local authorities, developers, and residents.

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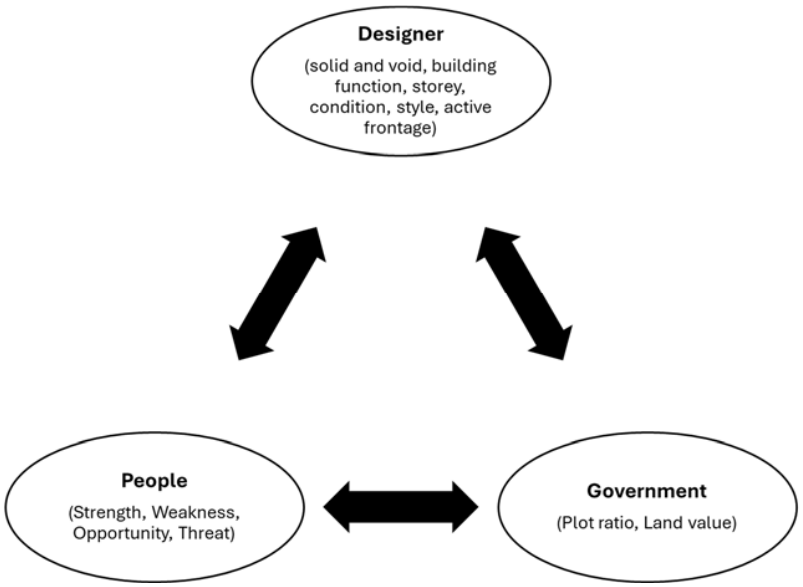

Fig. 12. Revitalization approach based on triple participation

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ПОЛИТИКА СОЗДАНИЯ БУФЕРНЫХ ЗОН И ЕЕ ВЛИЯНИЕ НА СТОИМОСТЬ ЗЕМЛИ И КАЧЕСТВО ЗАСТРОЙКИ ПРИМЕНИТЕЛЬНО К ОБЪЕКТАМ ВСЕМИРНОГО НАСЛЕДИЯ НА ПРИМЕРЕ КАМПУНГ-ДЖАВЫ, МАЛАККА, МАЛАЙЗИЯ

Сейед Мохаммад Мусави[1], Шарийе Хоссейнинасаб[2], Вакас Ахмед Махар[3,4]*

[1] Кафедра архитектурного проектирования, факультет искусства и архитектуры, Университет Персидского залива, Бушер, Иран
[2] Факультет архитектуры, Исламабадский университет COMSATS (CUI), кампус в Лахоре, Лахор, Пакистан
[3] Кафедра архитектуры, факультет архитектуры и градостроительства, Университет искусства, архитектуры, дизайна и наследия Арор, Суккур, Пакистан
[4] Лаборатория устойчивого проектирования зданий (SBD), кафедра градостроительства и экологической инженерии (UEE), факультет прикладных наук, Льежский университет, Льеж, Бельгия

*E-mail: architectwaqas@hotmail.com

Аннотация
Введение: Буферные зоны в контексте объектов всемирного наследия играют важную роль в том, что касается защиты исторических памятников и зданий, а также прилегающих к ним охранных зон, от городской застройки. Однако здания, располагающиеся в границах буферных зон, могут страдать от законодательных ограничений, в том числе ограничений, касающихся строительства. Такие ограничения могут повлиять на рыночную стоимость и сделать такую недвижимость непривлекательной для государственных и частных инвесторов. **Целью исследования** является критический анализ влияния политики создания буферных зон на градостроительство, в частности, на стоимость земли и качество застройки в контексте объектов всемирного наследия. В качестве объекта исследования выбран район Кампунг-Джава в городе Малакка (Малайзия), внесенном в список всемирного наследия ЮНЕСКО. **Методы:** В рамках исследования применялись качественные и количественные методы. Требуемые данные были получены путем непосредственных наблюдений, полуструктурированных и неформальных интервью с заинтересованными сторонами и местными органами власти, а также анализа имеющихся статистических данных и карт. В целях тщательного изучения сооружений в Кампунг-Джаве проведены наблюдения на месте и анкетный опрос. **Результаты:** Низкая стоимость земли в буферных зонах может быть обусловлена рядом специфических условий, трансформирующих эти зоны в заброшенные. Предлагается проектное решение для рассматриваемого района. Показано, что определенные решения на уровне формирования политики, включая вовлечение всех заинтересованных сторон, могут стать определяющими в повышении стоимости земли и улучшении рынка недвижимости в буферных зонах.

Ключевые слова: буферная зона; объекты всемирного наследия; стоимость земли; заброшенная территория; Малайзия.