

Sustainability of Urban Cemeteries and the Transformation of Malay Burial Practices in Kuala Lumpur Metropolitan Region

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Abstract—Land shortage for burials is one of many issues that emerge out of accelerated urban growth in most developing Asian cities, including Kuala Lumpur. Despite actions taken by the federal government and local authorities in addressing this issue, there is no strategic solution being formulated. Apart from making provisions for land to be developed as new cemeteries, the future plan is merely to allocate reserve land to accommodate the increasing demands of burial grounds around the city. This paper examines problems that arise from the traditional practices of Malay funerary as well as an insight to current urban practices in managing Muslim burial spaces around Kuala Lumpur metropolitan region. This paper will also provide some solutions through design approach that can be applied to counter the existing issues.

Keywords—Kuala Lumpur metropolitan region, Malay burial practices, sustainable development, urban cemeteries.

I. INTRODUCTION

THE issue of land shortage for burial represents a pressing concern in the capital city of Kuala Lumpur. This problem has been reported intermittently in the local newspaper [1, 2]. This paper concentrates on the Muslim cemeteries within the metropolitan region of Kuala Lumpur. Apart from the lack of space and overcrowding within the cemetery, the migration of Malays from rural to urban districts throughout the last few decades has also contributed to the escalating Muslim population in Kuala Lumpur [3]. With such migration into capital cities, the government must provide sufficient burial facilities for the growing city's inhabitants. This problem has been exacerbated by the conventional practice of Malay burial rites as well as lack of comprehensive planning in managing urban cemeteries by local authorities.

There are two research questions to be examined: (i) How public cemeteries in the metropolitan region of Kuala Lumpur can be sustained for tomorrow's use before burial spaces become a crisis? (ii) How can the understanding of cultural transformation of others help to create urban cemeteries that adapt to urban densification processes within the framework of tradition and cultural Malay society in the metropolitan area of Kuala Lumpur? This paper aims to analyze the issue of land shortage for burial within the urban context, and this will be discussed in referring to the definition of sustainable development. This will help to examine the future development of public cemeteries in Kuala Lumpur.

In formulating possible solutions to this problem, there are

two main components that will be discussed in this research. First, in overcoming this urban problem, the aspiration of Kuala Lumpur to be recognized as a livable city has been taken as a primary consideration. Second, this paper will also address the survival of Malay funerary practices and the direction it might take in the emerging era of globalization.

According to the Kuala Lumpur Structure Plan 2020 (KLSP 2020), sustainable development has been identified as the main guideline in Kuala Lumpur achieving the status of a livable city [4]. KLSP 2020 has listed down the development guidelines, which are closely related in raising the bar for a better living environment by providing for much better facilities to the public. The question is how should sustainability development be approached when addressing the lack of space for burial in urban areas?

A livable city must not only care for the wellbeing of the living, but both the living and the dead. With a growing population, the issue should not be taken lightly as it could become a potential threat to Kuala Lumpur in accommodating sufficient burial spaces in the near future. As an example, the same issue has reached its climax in the neighboring city of Jakarta, which has been reported by the local media [5, 6]. Therefore, it is necessary for these sacred spaces to be examined in order to redefine the role as well as the potential of urban cemeteries in strengthening the vision of Kuala Lumpur as a world-class city.

However, KL is still far from being sustainable as there are many issues that need to be addressed. Urban heat island, flash flooding, landslides and haze are some of the urban issues that link directly to the climate change in the city of KL. Dasimah has concluded that one of the ways to approach this situation is through manipulation of design on the local weather. She suggests that by incorporating the climate responsive design strategies, they can assist in making the city sustainable, livable and attractive, thus achieving the city's vision [7]. Hence, cemeteries can double-up as green spaces that would help to address some microclimatic and urban heat island issues, which would contribute to the sustainability of Kuala Lumpur. Cemeteries also become a retention area for rainwater by slowing down the water run-off, as well as increasing the amount of water being absorbed into the ground.

In a report prepared by UN-HABITAT, planning and management are the two main emphasized criteria that enable the development of a city to be more sustainable. The said report places its main concern in highlighting the environmental aspect, which can be achieved through

corporations, governments and communities [8].

Scheer & Scheer [9] have listed several idealistic characteristics of sustainable development for the intermediate city of Chiang Mai, which could also be applicable to Kuala Lumpur cemetery. For the purpose of this paper, there are five significant features of sustainability that have to be considered in order to strive for balanced urban cemetery development.

- (i) Compactness; create and preserve higher density, compact forms.
- (ii) Conservation; preserve the urban region's agricultural land, water systems, recreational areas, and fragile ecologies.
- (iii) Integration; provide a mix of land uses.
- (iv) Provide open space and
- (v) Encourage moderate parcel size.

This research will approach the term of urban sustainability based on the definition stated by both authors in three interrelated spheres that includes environmental, social, and cultural factors.

First, urban cemeteries possess their own unique biodiversity within the city. They are contributing to the ecological diversity of urban ecosystems. Moreover, urban cemeteries could also become a part of the urban green network. Wong stated that large green areas definitely have positive effects on the temperature of the city [10]. However, a research conducted by Baharuddin has somehow not incorporated the extra function that cemeteries already possess, which is part of urban green space [11]. It is important for people to acknowledge public cemeteries as unique urban sanctuaries; however, urban cemeteries can offer more than this.

Second, Kuala Lumpur could make full use of space in public cemeteries by making them into accessible green areas. This would provide people with another alternative for recreational activities as outdoor public space in Kuala Lumpur itself is gradually diminishing [12]. Abidin has outlined the prevailing criteria that should be considered when ascertaining the successful design of Malaysian public space. She suggests that by incorporating the climate responsive design strategies, they can assist in making the city sustainable, livable and attractive, thus achieving the city's vision. Accessibility, a better way of living and conservation of local culture are some of the crucial elements that should be taken into consideration when it comes to creating urban space. Thus, public engagement can be incorporated into these dead spaces through design intervention and a well-planned landscape. However, while creating a recreational space might be an alternative potential, we still need to consider the cultural values and perceptions that the public has towards cemeteries.

Abidin Usman, Tahir, and Yap described the relationship between social and cultural context to public space in Malaysia in their own words.

“The concept of the public realm, achieving a sense of place and the public significance of new development, is vital within the urban design perspective. Matters such as community safety, accessibility, sustainability, quality of life

and protecting the heritage legacy, are key concerns within the public realm and are significant elements within the urban design agenda.”[13]

Nevertheless, Malay people do not regularly go to cemeteries other than to visit the graves of their relatives on certain annual occasions. In Malaysia, Eidul-Fitr is the major celebration where it is common to see Muslims visiting graves around these times of the year. For the first few days of Eid, people will normally visit the cemeteries with their family members to offer prayer as a sign of remembrance towards the deceased.

Furthermore, Malaysians generally still exhibit residual superstitions that associate graveyards with poltergeist activity. This cultural stigma has been firmly cemented into their perceptions, which are further solidified by the existing conditions found inside the graveyard itself. The atmosphere in public cemeteries is usually dead and in a gloomy state. Lack of maintenance has also become a contributing factor. The Federal Territory Islamic Affairs Department (JAWI) has taken their own initiative in eliminating this problem by trying to change the landscape of public cemeteries. The KL-Karak Muslim Cemetery in Gombak has evidenced such effort by JAWI recently. JAWI's intentions in creating landscaped cemeteries should be highly praised as a first step in improving the physical characteristics of urban cemeteries. But it has not been able to bring the public into the cemetery's compound for recreational purposes.

In Taiwan, government efforts in turning public cemeteries into a recreational area are moderately successful, even after three decades. People remain disinclined to consider the 'park-like' cemeteries as regular parkland [14]. It is commonly understood that a cemetery is a place to dispose of dead bodies and this primary role is incompatible with its concomitant usage as public parkland. Yet, this step should be promoted in order to provide more open spaces for the Malaysian public; the measure of success for this space for social use is a secondary consideration.

As part of social infrastructure, the most important thing is to ensure that all urban cemeteries are accessible to the public. This is because public cemeteries could offer people another alternative to the recreational areas in the city. However, it should be acknowledged that the recreational use between cemeteries to public parks is not comparable as burial space has its own primary purpose, which is to house the dead. Thus, this research is an attempt to balance between the conventional role of a cemetery as a place to disposed the corpse with its potential as a public space. In this paper, some recommendations will be made through a practical design approach in making the burial grounds more open to the users.

Third, customary rites that are being practiced by people at graves have emerged as another key consideration. Malay burial practices are another aspect that has to be factored into the perspective of sustainability. The preservation of Malay customs in burial rites and funerary practices at the graveyard is just as important as its environmental significance. This study suggests that Malay burial practices have to go through some form of transformation in order to adapt with the fast

pace of urban development. If so, how can Malay burial rites and customs move forward? What are the next steps that should be taken? And what would a new model for Muslim cemeteries look like in the twenty first century?

In his article, Park stated that changes that have taken place in South Korean urban cemeteries are caused by the same common factors, that is, the issue of space [15]. In a similar way, spatiality is also the main key in addressing the roots of the problems in Malay funerary practices

In order to understand more about the impacts of urbanization and the effects it has towards Malay burial practices in Kuala Lumpur, this paper will be organized as follows. First, the paper will review the progression of Malay burial practice in Kuala Lumpur from its early origin until the present time. Second, the paper will discuss site visits that have been conducted at six public cemeteries around KL as a means of assessing their existing conditions.

This collected data has been presented in the form of a checklist (refer to the appendix). Findings and data analysis will then be discussed based on the definition of sustainability. Finally, this paper proposes some possible solutions to the scarcity of land for burial in the metropolitan area of Kuala Lumpur.

II. THE DEVELOPMENT OF MALAY CEMETERIES IN KUALA LUMPUR

A. Background of Malay First Settlement and their Graveyards

In the late nineteen-century Malay burial grounds were located outside their village settlement, which is commonly known as “kampung”. The establishment of Malay cemeteries around Kuala Lumpur followed the same pattern, well removed from human interaction. The map shows the clear disconnection between these two [Fig. 1]. It is clear that cemeteries have been pushed aside, out of the city’s development from the beginning. With the establishment of more kampung settlements around the city, public cemeteries were progressively marginalized within the city’s urban plan. Fig. 2 shows the expansion of settlement area for Malay in Kuala Lumpur, which is marked by the dark blocks. The situation becomes more critical when Kuala Lumpur became spatially contested much later following a rapid process of urbanization. This can be witnessed by looking at the allocation of burial spaces around Kuala Lumpur, which is not in proportion to the Malay settlements [Fig. 2].

B. The Issue Faced by Malay-Muslim Cemeteries in Kuala Lumpur

Fundamental problems with the traditional rites of Malay burial practices are mostly found on the graves’ surface. For example, family plots, monumental structures, built-up personal demarcation, and random planting are usually reflected in the landscape of Malay cemeteries. Hence, are these practices considered sustainable? To a certain extent, there are some, which are not in line with the concept of sustainability as previously discussed, and few are.

Some of the traditional burial practices performed over the

graves give unique characteristics to the landscape of Malay cemeteries. For example, family plots have existed for a long time in old cemeteries and it really has had an impact on the amount of space utilized overall [Fig. 3].

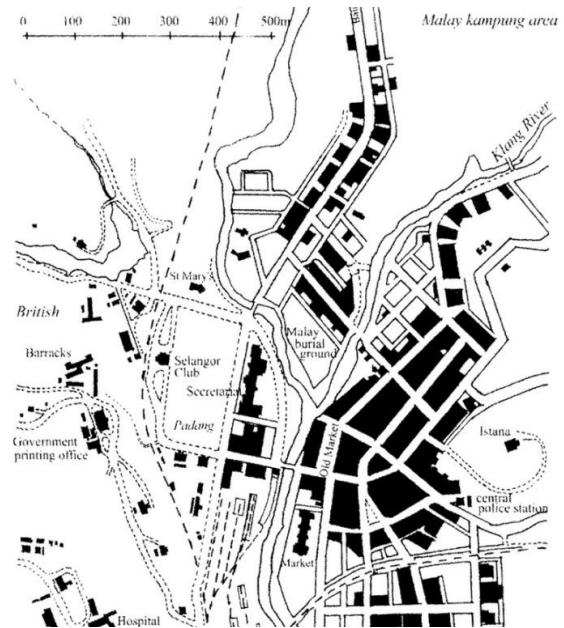


Fig. 1 Map of early Malay settlement in Kuala Lumpur in relation to location of graveyards, demonstrating the evident disconnection between them Source: Kuala Lumpur and Putrajaya: Negotiating Urban Space in Malaysia by Ross King (2008)

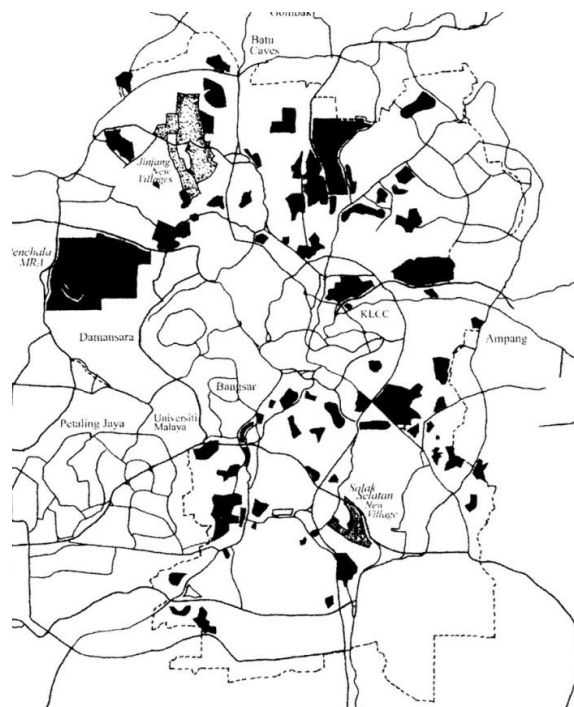


Fig. 2 The Malay reservation areas, traditional and modern kampung, and new villages of Kuala Lumpur Source: Kuala Lumpur and Putrajaya: Negotiating Urban Space in Malaysia by Ross King (2008)



Fig. 3 A family plot in Jalan Ampang Muslim Cemetery (2011)

Monumental structures are not considered to be as sustainable, since they tend to monopolize space and reduce the land available for further burial plots. The grave structure is known as a “kepek” and reflects a surviving Malay art form in Muslim cemeteries around the city [Fig 4]. Kepuk is an overlying structure that is commonly found on Malay graves. It consists of horizontal slabs made of solid concrete and the kepek surface is normally ornamented with various tiles used as finishes



Fig. 4 Kepuk is typically use to keep the graves surface intact which can be seen in this picture taken in Jalan Kuari Muslim Cemetery (2011)

Some people were also keen to have excessive built-up structures as a way to demarcate a particular grave. The structures that made up this boundary can be found either in a vertical or horizontal position, and they were made up of different material, from a piece of slab to perimeter fencing [Fig 5].



Fig. 5 White marbles is used to indicate the grave's territorial area from the rest in Jalan Damansara Muslim Cemetery (2011)

In term of random planting, Muslims are encouraged to grow plants over their graves in Islam in order to fulfill the religious requirement. The sole reason behind this is that Muslims believe that trees and shrubs are praying to the dead, and such benevolent practice is going to benefit the deceased underneath [Fig. 6].

All these practices were performed as part of Malay funerary culture and rites, even though some of them are not considered to be obligatory in Islamic teaching. In Malay cemeteries, excessive ornamentation over the graves serves no purpose other than to physically demonstrate personal attachment to the deceased.



Fig. 6 Graveyard's compound were furnished with a variety of plant in Jalan Damansara Muslim Cemetery (2011)

Compactness that allows for greater density should be promoted in order to sustain the ability of burial space to extend its function in housing for the dead bodies. This would then enable cemeteries to have a higher level of efficiency in accommodation of more corpses. In fact, this principle has been implemented in other Islamic countries like Kuwait. In his article, Iqbal draws a comparison between the nation's burial management and ‘McDonaldization,’ that is, well organized and systematic in a similar way to the globalised fast food franchise. The main objective is to focus on the quantity in producing a large number of graves of similar quality [17].

This paper also explores the survival of Malay cemeteries as a cultural landscape. For the last few decades, people do not possess the same freedom enjoyed in the past. Authorities have begun to take control over the activities that happened over the graves by reinforcing strict regulations at the cemetery. Francis, Kellaher and Neophytou stated that public cemeteries have been controlled largely by the management, which is eroding the sustainable aspect of funerary culture. The management of public cemeteries is very much determined by the limited resources that have shaped such policies [18]. This phenomenon has been happening to urban cemeteries around Kuala Lumpur especially throughout the nineties. People are expected to observe the rules regulating graves as a way to control and minimize the impact of overcrowding inside the cemetery. As a consequence, Malay

graves have become more uniform in their appearance and begun losing their unique characteristics.

In terms of the social aspect, public cemeteries in Malaysia have never been used as part of public space. One of the reasons is due to the regulation that prohibits people from entering the cemeteries other than having intention to visit the graves. Furthermore, from interviews conducted with the locals, superstitious beliefs among Malaysians have prevented them from spending their time at the cemetery. Malaysians are not keen to go and be there as it is not part of the Malaysian culture. However, this stereotype among Malaysians could be changed by persuasion of the beneficial values that cemeteries offer.

In order to improve the social significance of urban cemeteries, there are two different ways of approaching this matter between the former and latter cemeteries in Kuala Lumpur. The first group can be classified as former urban cemeteries. Old cemeteries in Kuala Lumpur were built even before the declaration of the country's independence. Considered to be pre-independence burial grounds, they have been around for 50 years or more. Most of the time these places represent deserted land in the city with a dull environment and unpleasant view. They offer only limited potential and opportunity of retrofitting, especially if involvement from the public is to be incorporated.

For the latter cemeteries, they represent new paths that seem to have emerged in recent years around metropolitan Kuala Lumpur. First, authorities are keen to develop land for burial with a garden or park theme. Second, the cemetery itself has a multiple role or hybrid functions in improving public health and life. Leisure and light recreational activities, even contemplation, are now possible within the grounds of the cemetery. Vast hectares of land originally designed for graveyards are now being used for the benefit of the living. Taman Selatan Memorial Park in Putrajaya, Section 9 Muslim Cemetery in Petaling Jaya, and KL-Karak Muslim Cemetery in Batu are some examples of urban cemeteries that were built according to these progressive principles.

In spite of that, Kuala Lumpur is still searching for the right model of urban cemeteries. Thus alternative solutions have to be formulated urgently, not only to avoid serious urban repercussions, but also to ensure the survival of Malay burial practices, something that is possible to achieve through modification of grave design and methods of burial. Alternative methods to full body burial are also needed due to its inflexibility.

C. Public Cemeteries for Muslims in Kuala Lumpur

Fig. 7 shows the location of Muslim cemeteries according to their "kariah" territory. Kariah is a term equivalent to parish and there are six main kariah in Kuala Lumpur (Fig. 7). A single Muslim cemetery is sometimes shared among three or four kariah and each of them is responsible for taking good care of their own graveyard. Beside regular maintenance from the city council, Muslim communities are expected to take part in keeping up the cleanliness of their own graveyard. This is normally conducted by organizing occasional events

between the kariah members (Muslim communities) and local authorities.

In a way, Malay people remain very much attached to their graveyard at the community level through their kariah. However based on the site visits to several public cemeteries around Kuala Lumpur metropolitan, the relationship between Malay people and their cemeteries is physically loose. Efforts to establish greater social ties among kariah members will positively impact on cemeteries, and will provide further opportunities to draw people into this space.

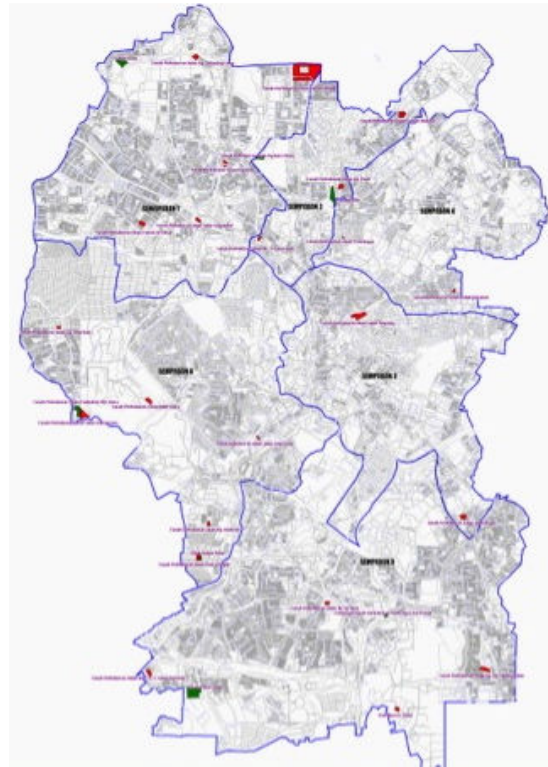


Fig. 7 Map of Muslim cemeteries around Kuala Lumpur according to their kariah district Source: Kuala Lumpur City Hall (2011)

According to the data obtained from Kuala Lumpur City Hall (DBKL), public cemeteries around the city are almost running out of space. From Table I, altogether there are 21 Muslim cemeteries in Kuala Lumpur. Out of 16 active Muslim cemeteries, 13 of them are left with burial space of less than 20,000 square meters, while five of them have already reached full status. However there are seven committed cemeteries allocated for future use, though it is uncertain how this land will be developed as burial grounds (Not shown on Table I)

The largest Muslim cemetery in KL is 170,000 square meters, known as Karak Muslim Cemetery. This cemetery is predicted to last until 2061, which is less than 49 years from now. It is meant to serve all the Muslim community in the city, regardless of their kariah area. To conclude, obviously there are only a few spaces available for burials in most Muslim cemeteries around the city. One main point is that with the creation of large areas such as KL-Karak Muslim Cemetery in Batu District, burial space for Muslims has begun to take the form of centralization. This is because burial at KL-Karak Muslim Cemetery is open to all Muslims regardless of their kariah district. This was permitted by the Federal Territory of Islamic Affairs (JAWI) to alleviate the lack of space for burials in some kariah zones.

D. Extended Metropolitan Region of Kuala Lumpur

It is important to look at this issue at the macro scale so that the right models of urban cemeteries can be produced. The pattern of urbanization in Kuala Lumpur is based on the corridor development [Fig 8]. This would help in developing new townships that are planned according to the local needs of the public for burial facilities. Furthermore, the land use in the city of Kuala Lumpur has become dense and the future allocation of land for public cemeteries does not look promising.

The map shows the use of land in Kuala Lumpur including cemeteries [Fig 9]. The yellow represents the residential area while the green is meant to be for open space and recreational use. Even though the residential area keeps expanding, city councils are less concerned with new green open space, which includes provision for cemeteries. The current way city councils cater for burial spaces are generally based on the availability of land around the city rather than being based on the local demographic.

New land for public cemeteries has been opened according to super induced development [19, 20]. Government has less control when it comes to the allocation of new land for cemeteries throughout the city. Nevertheless, burial facilities in Kuala Lumpur should be updated more in order to catch up with a growing population. It will not take long before all public cemeteries in Kuala Lumpur will become full as currently there has been no action in recycling the old graves. Governments have to focus on developing the new public cemeteries beyond the city limits, as Kuala Lumpur has increasingly become densely developed and overpopulated.

With the expansion of suburban area outside the city centre, it is important to take notice of the impacts that it has in accommodating for burial facilities as a whole. If authorities

TABLE I
MUSLIM CEMETERIES IN FEDERAL TERRITORY OF KUALA LUMPUR

Existing Muslim Cemeteries	Area (m ²)	Status	Area Available
Kariah 1			
JalanSegambut M.C.	14,200	Active	12,000
Taman Sri Sinar M.C.	19,700	Active	12,000
KampungSelayang Lama M.C.	19,400	Active	4,000
KampungBatu M.C.	18,000	Full	0
KL-Karak M.C.	327,500	Active	170,600
Kariah 2			
KampungPuah M.C.	18,300	Full	0
Batu 3, Jalan Ipoh M.C.	9,600	Full	0
Taman Ibukota M.C.	30,100	Active	8,000
Kariah 3 - Existing			
JalanKuari M.C.	22,000	Full	0
JalanAmpang M.C.	52,200	Active	1,000
Kariah 4			
DatokKeramat M.C.	9,100	Active	1,000
Titiwangsa M.C.	2,100	Active	2,000
Kariah 5			
Kg. Bohol, Batu 71/2, JalanPuchong M.C.	18,300	Active	2,500
Kg. Sungai MidahDalam M.C.	27,900	Active	20,000
Jalan Sungai Besi M.C.	9,900	Active	1,000
Kg. Bohol, Batu 71/2, JalanPuchong M.C.	18,300	Active	2,500
Kariah 6			
KampungKerinci M.C.	10,700	Active	2,000
JalanDamansara M.C.	80,000	Active	38,000
Sungai Penchala M.C.	6,700	Active	1,000
Bukit Kiara M.C.	6,000	Active	38,000
PantaiDalam M.C.	20,000	Active	12,000
JalanAngSeng M.C.	4,600	Full	0

are not careful in locating urban cemeteries, the landscape of Kuala Lumpur could end up deteriorating in a manner similar to former Seoul. Here, graveyards were dominating the city's landscape because close monitoring from the government was absent [15].



Fig. 8 Map of corridor development

Source: Kuala Lumpur and Putrajaya: Negotiating Urban Space in Malaysia by Ross King (2008)

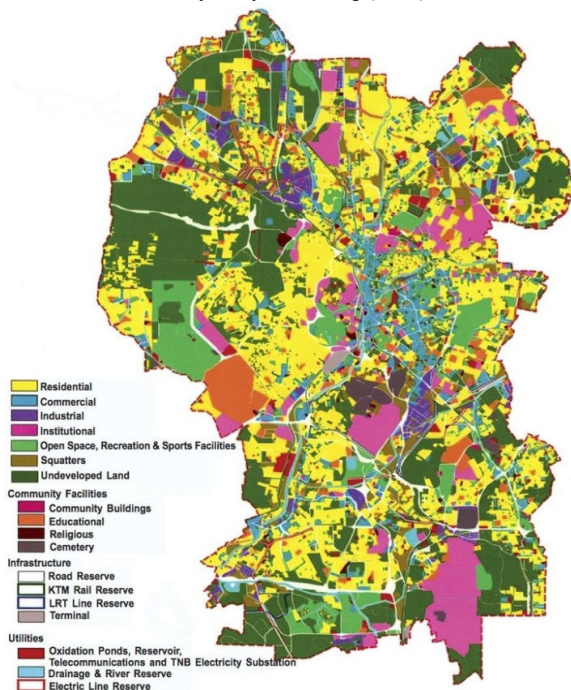


Fig. 9 Map of land use in Kuala Lumpur, cemetery is located under category of community facilities

Source: Kuala Lumpur Structure Plan (2004)

Even though this research does not survey all public cemeteries beyond the Kuala Lumpur perimeter, two Muslim cemeteries within the extended metropolitan region have been selected as part of the case studies. The first one is a Muslim Cemetery at Taman Selatan in Putrajaya and the other is a Muslim Cemetery at Section 9, Kota Damansara in Petaling Jaya. Putrajaya is a recent township that functions as an administrative capital for Malaysia, while Petaling Jaya was the first satellite city to be developed to deal with the increasing population in Kuala Lumpur.

III. METHODOLOGY

A. Research Method

This research applies the method of case studies in four stages, known as descriptive, explorative, comparative and speculative. In the beginning, the research is to describe the process and the relationships that exist within the case studies. Next the research explores the key problems affecting the case studies as well as the opportunities in dealing with the problems by searching for alternative methods to funerary practices and interment. After that, case studies will be compared to identify the similarities and differences between them. Finally, possible solutions will be proposed by speculating about some results from the findings. The sustainability aspect of urban cemeteries has been taken into account in making suggestions.

B. Data Collection

In conducting this research, the first step is to gain information from secondary sources collected from the related agencies, as well as interview representative from JAWI. Kuala Lumpur City Hall (DBKL) records Muslim Cemetery in Federal Territory Kuala Lumpur and Kuala Lumpur Structure Plan 2020, these are the main documents used to investigate the data.

The second part of the research is the field trip that was conducted in Kuala Lumpur metropolitan area. The site visits were conducted in February and September of 2011. Comparative literature is another method used to understand the sphere of issues from a different cultural background.

The visits have been conducted in six public cemeteries around Kuala Lumpur where site observation and photography was taken. Most of the qualitative aspect of urban cemeteries was gathered using the checklist that was comprised of 16 elements. The site checklist has been purposely used to recognize changes in urban cemeteries around metropolitan Kuala Lumpur, as well as to provide the scale in measuring situations within public cemeteries.

Finally, discussion on data analysis was generated by making a critique based on the findings from the checklist in response to the three main aspects of research, which includes environmental, social and cultural factors. This was done in order to support research objectives in promoting sustainability in urban cemeteries around Kuala Lumpur within those fields.

TABLE II
THE CASE STUDIES

Cemetery	Remark
Jalan Ampang M.C. (JAMC)	It was nearly full but the burial space has been extended
Jalan Kuari M.C. (JKMC)	Completely full, as there is no available land left to do burials
Jalan Damansara M.C. (JDMC)	It was nearly full but the burial space has been extended
KL-Karak M.C. (KLKMC)	Recently built and the largest burial ground for Muslim in Kuala Lumpur
Section 9 M.C. (S9MC)	Recently built and among the largest burial ground for Muslim in Kuala Lumpur metropolitan
Taman Selatan M.C. (TSMC)	The benchmark model for urban cemeteries in KL metropolitan region

C. Case Studies Criteria

The case studies consist of six public cemeteries around Kuala Lumpur metropolitan. Observation on each cemetery has been conducted and recorded in the form of a checklist during the site visits. The checklist has been used in the three following ways: (i) to trace the roots of the problems in urban cemeteries around Kuala Lumpur; (ii) to justify the situations over the actual sites without merely relying on the data acquired from agencies; and lastly (iii) to gather data on the physical characters of public cemeteries. Table II shows the list of the case studies involved along with the reasons why they have been selected. The case studies can also be distinguished between the old and new public cemeteries. JAMC, JKMC and JDMC can be considered as the former burial space while KLKMC, S9MC and TSMC are being the latter.

IV. FINDING, DATA ANALYSIS AND DISCUSSION

For the purpose of analyzing the data and explaining the findings, each 16 elements have been categorized under five characteristics of sustainable development, which are compactness, conservation, integration, provision of open space and encouragement of moderate parcel size as shown in Table III. Each checklist item has been categorized under certain characteristic of sustainable development that resonates with them.

TABLE III
CLASSIFICATION OF 16 ELEMENTS OF PUBLIC CEMETERIES UNDER FIVE CHARACTERISTICS OF SUSTAINABLE DEVELOPMENT

Characteristic of Sustainable Development	Checklist Items
A. Compactness	Site locations Area Grave arrangement Graves practices
B. Conservation	Topography Drainage system Vegetation Softscape (graves)
C. Integration	Spatial relationship People activities Facilities provided
D. Provide open space	Perimeter boundary Degree of openness Vehicle accessibility
E. Encourage moderate parcel size	Grave's spatiality Hardscape (graves)

A. Compactness

1. Site location

Most public cemeteries in the case studies are being isolated from their surrounding context. For example, this situation can be witnessed in the old public cemeteries such as JKMC and KLKMC [Fig. 10 & 11]. In the case of JKMC and KLKMC, even though residential area is located close to the cemetery however, there are no links made between them. Conventional methods planning for burial space that have been practiced during the old regime have placed public cemeteries physically and sometimes visually segregated from the surrounding context.



Fig. 10 Map of Jalan Kuari Muslim Cemetery (2011)

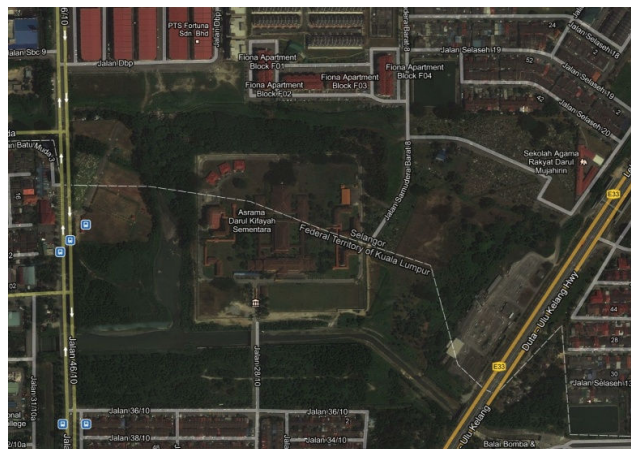


Fig. 11 Map of KL-Karak Muslim Cemetery (2011)

In comparison to the old ones, new public cemeteries such as TSMC have been incorporated within public space [Fig 12]. With the new genre of urban cemeteries, the inclusion of cemeteries as part of public parks and green networks is gradually taking place. This significant change was motivated by a great concern among local authorities in opening up cemeteries for public use. This pattern is expected to be normative in establishing public cemeteries in the future.



Fig. 12 Map shows the vicinity of Metropolitan Park (top left) to the Taman Selatan Muslim Cemetery (2011)



Fig. 13 Map shows the exclusion of Section 9 Muslim Cemetery from its surrounding context (2011)

In terms of planning, both sites are located further from human settlement a decision that was considered to be more appropriate in Malaysian culture [Fig 12& 13]. Nevertheless, the design layout of TSMC was built to be more open and accessible compared to the conventional public cemeteries. As for S9MC and KLKMC, the intention to open up this cemetery for public use has somehow not been shown and executed through its design layout.

With the current pattern of public cemeteries in Kuala Lumpur, the allocations for burial grounds are still concentrated within the city's boundary. In regards to this matter, Malaysians should be persuaded to take advantage of cemeteries' greenery space for their recreational benefits. The inclusion of cemeteries as part of residential areas is no longer suitable in the city.

Sites for urban cemeteries could have been remotely located beyond the city limit; however, there will be least intervention from the public due to the factor of time and distance to travel. Moreover, such practice would also hinder the funeral ceremony from being accomplished efficiently, as Islam requires the body to be buried immediately after death. Furthermore, it is such a waste if the public does not have easy access to these alternative amenities, if urban cemeteries are to

be located beyond the city's limit. At the moment, land for burials still available within Kuala Lumpur metropolis and should be fully utilized to its optimum level in facilitating the needs for both living and the dead.

2. Area

Based on the case studies checklist, area for burial in public cemeteries has significantly become greater in term of its size. The old cemeteries (JAMC, JKMC and JDMC) were established between 1940 and 1980. The new cemeteries (KLKMC, S9MC and TSMC) were in operation at the turn of the twenty-first century. This phenomenon was obviously caused by the increasing mortality rate in the city due to the growing number of population. It is understood that the migration of people into the metropolitan area of Kuala Lumpur is progressive. Hence, the numbers of cemeteries will continuously add up along with the size area.

At present authorities back-up plan constitutes providing more land to be used as cemeteries. Even though this seems to be a logical step in handling the issue of land shortage for burial, it is important for authorities to reassess the impacts and consequences. There are two factors that should be discussed in relation to the cemetery area. First, the scale of operation and second, making the most out of new developed land for burial use.

By increasing the total area of new cemeteries there will be more burial grounds to manage. This definitely demands a higher level of maintenance and supervision especially for a public cemetery with a huge scale area such as KLKMC. By learning from the examples of old cemeteries, the authorities have found it challenging to maintain the quality of the surroundings. The physical conditions in public cemeteries are usually found to be poor and this is something commonly known among Malaysians.

Even with the involvement of kariah members taking care of their own burial grounds, it would be very difficult to ensure the cleanliness of public cemeteries, as this communal activity is not normally carried out on a regular basis. Besides, it is hard to get kariah members to take part in this voluntary work, as some people do not perceive it to be necessary. They strongly feel that maintaining public cemeteries should be the responsibility of the authorities.

Rapid development appears to necessitate the sacrifice of reserved forest and protected land. In the case of S9MC, the exploitation on some parts of Sungai Buloh Forest Reserve to be developed into a burial space has created a controversial issue among the public realm. There is a conflict of interest occurring with the use of this precious forest divided between two parties. Some people insist that this natural environment should be preserved from any kind of development apart from the government's plan, while others see the need for a new cemetery as an answer to the escalating problem on lack of space in nearby Muslim cemeteries.

In regards to this event, the local authority must seriously investigate this matter as a public issue by taking a step forward in planning for burial grounds. An initiative to promote multiple roles for cemeteries represented a

compromise between different public interests. A new land has to be developed with a hybrid function in order to maximize its potential as well as to encourage public participation. Conventional cemeteries are normally being excluded from being integrated as part of the city's planning. However, with recent development in Kuala Lumpur, public cemeteries are expected to play more roles within the city's fabric other than accommodating for burial facilities to dispose the dead.

Therefore, it seems to be indispensable for urban cemeteries to be built at larger scale in Kuala Lumpur in order to incorporate the secondary role of cemeteries. Nevertheless, there should be appropriate order in spatial organization inside the cemetery without disrupting customary rites and burial practices. Multiplication of cemeteries' spatial functions will also ensure better safety and thus meet the high expectations from the users. In another words, authorities will be more inclined to keep up the standard of urban cemeteries from being neglected by turning them into the public domain.

3. Graves Arrangement

From conducted site visit, graves arrangement in the old cemeteries (JAMC, JKMC, and JDMC) is found to be loosely systematic [Fig 14, 15 & 16]. Accumulation of graves throughout years has resulted in dense burial grounds and overcrowding, especially in the former Muslim cemeteries. Narrow spaces between the graves make it hard for visitors to walk through and most likely to get lost in finding their way around. Most importantly, there have been no particular systems used, like blocks or sections, to guide and direct people around the place.



Fig. 14 The arrangement of graves at Jalan Ampang Muslim Cemetery (2011)

In the case of latter Muslim cemeteries, a method known as "SilangTikar" has been widely practiced around Kuala Lumpur including at KLMC and S9MC [Fig 17 & 18]. SilangTikar literally means weaving mats and this method is purposely used to serve as a guide in arranging the graves according to the grid layout within a cemetery's compound [Fig 19].

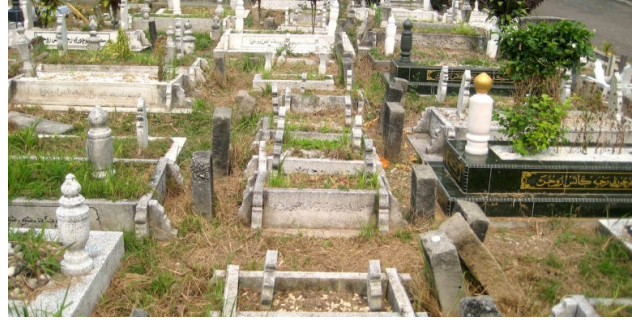


Fig. 15 The arrangement of graves at Jalan Kuari Muslim Cemetery (2011)



Fig. 16 The arrangement of graves at Jalan Damansara Muslim Cemetery (2011)



Fig. 17 The SilangTikar arrangement of KL-Karak Muslim Cemetery (2011)



Fig. 18 The SilangTikar arrangement at Section 9 Muslim Cemetery (2011)

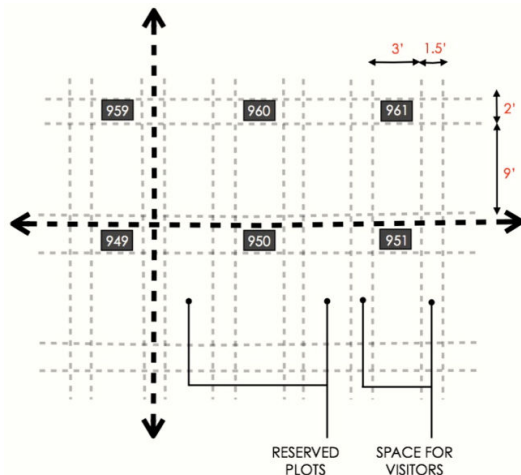


Fig. 19 The module of SilangTikar

Even so, this method has its own flaws particularly in reserving burial plots for future use. Based on this practice, the interval spaces between graves were supposed to be allocated for upcoming graves. However observation over the case studies in Kuala Lumpur has proven it has failed to do so due to intervention from visitors. In most cases, family members of the deceased were likely to dominate the gap between the graves. The spaces are normally occupied by building structures such as seating and the extensions from kepek.

There is an indication that the current practice is highly concerned with improving the capacity to contain higher numbers of burial plots in Muslim cemeteries. This explains the increasing size area in new cemeteries (KLKMC, S9MCand TSMC). However there are other alternatives, which can be employed in maximizing the use of burial space without having to clear vast areas of land. For instance, the usage of pre-cast concrete at Subang Lutheran Garden in Shah Alam has enabled for numerous numbers of grave plots within just a 50,000 square meter[Fig 20].The construction of this concrete vault as a confined structure could be adopted into Muslim cemeteries with some alteration to suit Islamic funerals. The usage of concrete vaults in Subang Lutheran Garden has also allowed for a better composition of graves with equal allotment of space being guaranteed for each plot.



Fig. 20 Picture shows the use of pre-cast concrete at Subang Lutheran Garden (Lei Wei Min)

Recycling the old graves is another technique that can be introduced into Muslim cemeteries without having to clear out a vast area of new land in the city. In fact this technique has already been practiced for Muslim burials in neighboring cities such as Singapore and Jakarta.

In Singapore, bodies from old graves have been exhumed and transferred to new smaller burial plots. Both Pusara Abadi and Pusara Aman are Muslim sections at Chuo Chu Kang Cemetery that have demonstrated this technique. The exhumation process was carried out under religious observance with the presence of surviving family members from beginning to end of the process. Albeit grave exhumation is not a common practice in Malaysia, however in rare occasions it is still permissible by Islamic tenet.

Based on the report project for TSMC, authorities' intention to recycle the old graves has not been practiced, as it is believed to be inappropriate with the local Muslim culture. Perhaps it is about time for Muslims communities to be open to this radical approach. At the moment this extreme procedure is a missed opportunity in sustaining Muslims burial facilities in Kuala Lumpur metropolitan.

In Jakarta, reusing the old graves has already been promoted even before the burial land shortage becomes a crisis. Lack of interest shown among people has hampered the practice until the scarcity of space has reached a climax in the city of Jakarta. Efforts to ease this chronic situation in this overpopulated city have forced local authorities to produce a few alternatives. It was reported that the City Cemetery Agency is hoping to alleviate the impact of land shortage by urging people to reuse their family graves. Known as stacked burial, this method allow for a single grave to hold up to three bodies with a year's gap in between burials.

Currently in Jakarta, under the grave tenure policy, graves have to be leased, which also means that graves in the public cemeteries are no longer in perpetuity. However, people are still allowed to extend the duration of their lease as long as they want. If there is no renewal the grave will then be offered to other families to rent in order to allow for a new burial to take place. Under this system the family no longer inherits the same grave. As a result, some people find this to be quite disturbing.

To a certain extent the local authorities in Kuala Lumpur should start to consider recycling the old graves in a similar way to what has been practiced in Singapore. The nature of graves would also have to change from perpetuity to temporary; something is culturally distant to Malaysian Muslims.

4. Graves Practices

In this research, grave practices are referring to human related activities over their beloved's graves to either symbolize their personal attachment or customary beliefs. For example, this can be personified through the elements of traditional practices such as a white cloth wrapped around the gravestones, family plots and planting shrubs. The existence of material culture such as fencing, decorative pebbles is also another different way to signify people's emotional

association with the dead.

Graves practices are probably the core elements that make up the unique physical characteristic in Malay cemetery landscapes. The survival of grave practices can be witnessed throughout the progression of Malay cemeteries from old generations to the new ones. From site observation, there have been tremendous changes in terms of customary practices over the graves. Malay grave practices are flourishing and found to be glorified in the old cemeteries [Fig 21], but somehow they have been downsized and some are being completely eliminated in the new cemeteries [Fig 22]. This intense situation has been caused by the effort of authorities to regulate popular customary practices regarding graves. It is one of the efforts taken by cemeteries management to prevent people from dominating the spatiality of graves. Thus, these strict regulations from the authorities will precipitate the decline of the Malay grave practices.



Fig. 21 Picture shows the grave practices in one of the old cemeteries in Kuala Lumpur; Jalan Damansara Muslim Cemetery (2011)



Fig. 22 Picture shows the grave practices in one of the new cemeteries in Kuala Lumpur metropolitan region; Taman Selatan Muslim Cemetery (2011)

There has to be a balance between cultural practices and the regulations within the cemetery; failing this, we may see an end to these unique Malay burial rites. In the context of Kuala Lumpur, authorities should be more attentive to the memorialization of graves in the Planning Guidelines. If

freedom is a major concern to some people, then maybe it is the time for Muslim cemeteries to change on the management side. Under non-government operation, people are given more freedom and alternatives within the cemetery according to their own interpretation on Islamic burials. For example, the management of San Diego Hills Memorial Park, which is located outside Jakarta metropolitan, represents a good example of Muslim burial practices based on the individual values and beliefs. In San Diego Memorial Park Hills Park, people are also exposed to endless possibilities in choosing the right grave model ranging from being the simplistic and moderate to highly grandeur grave plots. Here Muslims are allowed to maintain their grave practices without having to jeopardize the grave's spatiality. The availability of such options, however, seems best served by the privatization of public cemeteries.

B. Conservation

5. Topography

Old urban cemeteries (JKMC, JKMC) in the case studies of Kuala Lumpur are normally built on flat ground. This conventional practice also has been carried out in the new cemeteries (KLKMC, TSMC). This kind of landform is much preferred for Muslim burial; however this is not something mandatory in Islamic funerary practice as burial could also be done on a hilly slope. Historical Malay cemeteries were normally built on top of the hill so there is no reason why it cannot be applied to modern days cemeteries. Even though leveled earth surfaces make funeral ceremony much easier, it has not proven popular. Interesting walking experiences can be offered to visitors by taking advantage of the various elevations and depressions of the natural landform.

6. Drainage system

Even though some case studies like JDMC and S9MC were built on the hilly grounds, however both sites do not take advantage of the site's natural landform to mitigate the water run off. Instead of working with the existing landform, the standard practice of developing land for burial in Malaysia normally begins by clearing the land and then flattening it. As a consequence, such practice would normally require extensive work for the purpose of drainage, for example in TSMC. Typically, surface and subsurface drainage were normally used to channel the water out of the cemeteries area. In KLKMC, drainage system is found to be less efficient with several water ponds existing around the cemetery area.

7. Vegetation

It is common to find clumps of shady trees in Muslim cemeteries, in fact JAMC and JDMC is surrounded in a lush environment [Fig 23 & 24]. Regarded as urban sanctuaries in its own right, this has created a rich biodiversity within city ecosystems. There is no doubt that greeneries help to balance the local microclimate; however, this park-like ambience could also be open for public use with the right design approach. Cemeteries with a park theme concept will benefit public health and recreational use. In order to amalgamate the function of urban cemeteries as part of the city's park network,

natural growing trees should be retained and preserved as much as possible. It would be a great loss to cut all the existing trees, as newly planted trees would take some time to reach maturity.



Fig. 23 Picture shows the lush vegetation found in the surrounding of Jalan Ampang Muslim Cemetery (2011)



Fig. 24 Picture shows the lush vegetation found in the surrounding of Jalan Damansara Muslim Cemetery (2011)

8. Softscape (graves)

Malay people usually planted some trees over the graves as a way for dead bodies to receive blessings from their God. It is believed that by doing so, the trees would pray for the dead inside the graves. Traditionally, this practice originated from the Islamic customs. This has resulted in many variations of vegetation, particularly shrubs and small trees lying on top of the graves.

The problem with this practice is that shrubs are being planted randomly without any exact guideline. It does contribute to the green factors in Malay cemeteries, but on the other hand there is an issue with visibility. A specific design intervention should be established to avoid confusion among the visitors. Growth rate for shrubberies are happening at a fast pace and can sometimes create a visual barrier within the cemetery compound. Thus, visitors are finding it hard to find their way around.

Although this situation has been significantly improved in the latter cemeteries such as TSMC, most shrubs are not being planted over the graves. Prominent trees and shrubs that closely associate with Malay graves have been planted in a systematic order and arranged in a way to define the space and

function.

Considered as a grave's soft element, this practice should be continued for the reason that plants are beneficial to the environment especially in producing the oxygen for the human consumption.

C. Integration

9. Spatial relationship

In terms of spatial relationships within the cemeteries, the main problem found among case studies concerns the circulation of pedestrian, motorcyclist and motorist. Internal pathways do not provide visitors with a clear direction to their graves especially in the old cemeteries (JAMC, JKMC, JDMC) [Fig 25]. This situation will not only impede funeral ceremonies from running smoothly, but people also tend to get lost while searching for graves during their visit. This problem has been very much resolved in the new cemetery such as TSMC; clear and wider pathways are used to direct visitors to the graves [Fig 26]. However KLKMC and S9MC have chosen to emphasize the coherence of pedestrians as an important linkage within the cemetery's compound. The integration of roadways into public cemeteries is crucial for two reasons: first, it is making funeral ceremonies more efficient and second, it will increase the chances for the public to get into the space.



Fig. 25 The lack of pathways in Jalan Kuari Muslim Cemetery (2011)



Fig. 26 The provision of pathways linkages in Taman Selatan Muslim Cemetery (2011)

In regards to local authorities' aspiration in making cemeteries more open for public use, it is important for internal circulation to be redesigned in a way that promotes a higher patronage from the public. Multiple entrances should be encouraged rather than a single point of entry. Public

transport in Kuala Lumpur needs to be improved; the main medium of transport for people is car and motorcycle. A place that is hard to reach by this mode of transport will probably not get much attention from visitors. Another important point is that the distant between vehicle parking spaces and burial grounds should be located within a sensible walking distance. Hence, allocating parking space outside a cemetery's perimeter is no longer suitable.

10. People Activities

There is not a lot of human activity happening at the cemeteries in all the case studies. During the site visit, there were only a few people who came to visit graves with few funeral ceremonies taking place. Apart from that, there was some regular cleaning routine from the maintenance workers. Entrance restriction from the management team prohibiting the public from entering cemeteries also explained this situation.

The people who use the cemeteries can be divided into two main groups. First are the visitors who wish to visit their family's graves and, second, people who wish to use the recreational facilities. Without sufficient recreational facilities there will be less chance for people to visit, as there is no motivation for people to do so. Hence, public cemeteries without well-planned facilities would not be able to attract many people.

It is well known that cemeteries do cater for activity related to the funeral. Therefore the nature of public cemeteries around Kuala Lumpur is normally found to be away from human activities. New activities that would introduce public cemeteries have to be sympathetic to burial rites related activities such as praying over the graves and burying the dead.

In response to the situation in Kuala Lumpur, it can be concluded that cemeteries would only be able to attract people with a range of available facilities provided inside the area. Therefore, amenities become one of the factors that would determine the success urban cemeteries as public spaces.

11. Facilities Provided

From site observation, amenities at public cemeteries are being provided to assist people in carrying out burial related practices such as prayer halls and ablution facilities. Later cemeteries like S9MC and TSMC are provided with much better burial facilities that are not found in the former cemeteries. Both cemeteries were built with complete building facilities that cater rooms to wash and prepare the corpse for burial. Even though most Malay people still prefer to prepare the body at their own home, however such facilities would allow for funeral ceremonies to take place at the cemetery site. This would actually benefit the deceased, especially one without any surviving families members left.

There have been major changes between the old and new cemeteries in terms of the quality of facilities being provided. A complete burial facility has been provided at larger cemeteries such as S9MC and TSMC. Here, the type of facilities can be divided into two categories. First are the

facilities that are meant to assist the funeral to happen from the preparation of the corpse to the moment of interment. Second the facilities that are intended for visitors' use. Under the second category, those facilities have failed to be utilized by the target group due to poor site planning. These facilities mainly include pathways and jogging tracks, seating and benches, and also gazebos. Observation from Taiwan shows that beautiful landscaping in public cemeteries does not necessarily invite people to come and use the space. This is probably caused by the lack of walking tracks along with the absence of amenities within the cemetery area. Thus, various amenities alone are not enough to ensure the success of landscaped cemeteries. However they could become a magnet in welcoming people into the space.

The implementation of a park theme cemetery in Kuala Lumpur seems to be lost in the reality. Taking the examples of KLKMC and S9KD, both were planned to follow the examples of TSMC as a cemetery in a park. From observation, KLKMC and S9MC do not have certain criteria to engage people in using space in the cemeteries. Moreover, the type of recreational facilities being provided does not reflect on authorities' intention in making these places as a public space. Absence of budget is probably the main constraint to the lack of facilities in KLKMC and S9MC, though there is no doubt that the project construction can be done in several phases.

Building facilities should be centrally located within the cemetery area. This is important in order to disperse human activities as well as propagating multiple usage of public space around the cemeteries. Most of the case studies need to improve on the quantity of basic amenities that they are offering which includes a number of parking lots, seating, gazebos and pedestrian lighting. Again, this is important to draw a wider scope of people into this space.

To summarize, the design of the cemeteries should be appealing in a similar way to a public park where people are being exposed to various kinds of experiences along with adequate facilities. Cosmetic upgrades to the existing cemeteries would not make much difference in attracting numbers of people, which has been proven at KLKMC and S9MC. Even though there has been immense improvement of amenities in public cemeteries, the attention should now be focused in opening up these facilities to a wider group of the public.

In doing so, some cemeteries were situated near to the mosques. This was purposely done so that burials can be performed immediately after the preparation of the corpse was completed. Hence, the close proximity between mosque and cemetery brought potential for attracting people to come over and enliven the graveyard's atmosphere. Mosques can play their role in organizing the community events within their own kariah, which involve the cemetery as a public space. This module can be used in promoting the function of cemeteries as part of public space through a societal based program. In this way, the connection between mosques and cemeteries will also be taken to another level beyond the religious bond.

D. Provide Open Space

12. Perimeter boundary

Based on the site checklist, old cemeteries are mostly surrounded by the perimeter walls or fences to keep the graves safe from vandalism. If cemeteries are going to be integrated into public spaces, the perimeter boundaries should then be designed in a way to encourage people to move more freely through the space. High solid walls do not encourage interaction between cemeteries and its surrounding urban context. Perimeter walls will only establish segregation between the spaces. Even though a cemetery's main role is to keep the graves safe and intact, the perimeter structures can still be erected in a way that allows for visual connection and free flow of movement with the space within.

13. Degree of Openness

One of the characteristics being observed in this research is the permeability of public cemeteries in the Kuala Lumpur area. Apart from physical access, visual dimensions also help to determine the degree of openness in a cemetery. For example, the positioning of trees and shrubs inside TSMC was arranged in a way to define space [Fig 27]. This is important in making public cemeteries become visually accessible to pedestrians and motorists outside.



Fig. 27 Picture shows that trees and shrubs were used to define space in Taman Selatan Muslim Cemetery (2011)

14. Accessibility

Chances to increase public participation at landscaped cemeteries can be promoted by integrating burial space as part of the roadways system. This model has been realized through the creation of TSMC; the site has been intentionally designed to be more open. Passersby and motorists will see cemeteries as a welcome refuge from the city's hectic lifestyle. In doing so, multiple entries should be provided in order to evoke the bond and affinity with the public.

E. Encourage moderate parcel size

15. Grave's spatiality

This paper is also looking at the micro scale of graves in relation to users at the intimate level. Due to overcrowding in the old cemeteries, visitors are gradually losing their ritual

space, which is normally used in performing burial rites. The same thing is likely to occur in latter public cemeteries such as KLKMC and S9MC. The fact for interval gaps between graves will be used for burials in the future, there seems to be not many options left in keeping this ritual space.

Some interesting questions to ask are whether to preserve or eliminate this ritual space? How important is ritual space among users? And how should the design be approached? In the old public cemeteries, from observation we can see how these ritual spaces have been intruded and invaded due to the problems arise from overcrowding. This has created some difficulties among users especially during the grave visits. The ritual spaces have become narrow and in some cases, the space has simply disappeared and diminished. Contrary to the former cemeteries, this issue has somehow not being addressed in the new cemeteries. From site observation, the design outline in the new cemeteries is more concerned with systematic order of grave plots rather than fulfilling users needs.

In the case of new cemeteries, the space has undergone series of modifications. For instance at KLKMC and S9MC, the management are still acknowledging the need for the ritual spaces for grave visitors by allowing them to use the gap interval between the graves. However, some users have not been aware that the ritual space is temporary because it will be used as a new grave plot at a later period. Evidence from site observation has shown that ritual space is misused among visitors. Most of the time visitors are likely to occupy the spaces by building a hard structure over it [Fig 28]. This has left a problem to be solved on the management side and such action will not be tolerated in the new cemeteries graves. In recent years, any structures or vegetations found to breach the reserved graves plots would be demolished.



Fig. 28 Picture shows visitors were normally tend to occupied spaces between graves as found in Section 9 Muslim Cemetery (2011)

In the case of TSMC, SilangTikar is no longer being followed. Instead of reserving the grave plots, the arrangement of graves is done without leaving any reserve burial plots between the graves. Here, grave plots have been closely arranged next to each other, leaving only small gaps in between graves. This arrangement of graves has been imposed

on the early planning of TSMC, which left behind narrow spaces between graves. Consequently this has shifted the way visitors approach the graves. Instead of approaching the graves from the sides, visitors are expecting to do it from the head and feet.

activities in spite of the challenge to prolong burial facilities in the city.

16. *Hardscape (graves)*

Finally, the simplification of monumental structures (kepek) of the graves is one of the significant changes that can be observed in comparing the old (JAMC, JKMC, JDMC) and new (KLKMC, S9MC, TSMC) public cemeteries in Kuala Lumpur. Hard materials used for kepek are not environmental friendly since they are predominantly composed of concrete. They do not really serve much purpose, other than for aesthetic reasons.

Nevertheless, the amounts of hard materials used for kepek construction has minimized over the years. This is due to the concern of the excessive amount of space that is lost and wasted being occupied by kepek structures. The cemeteries management since then has closely monitored strict regulations pertaining to built up structures. As a result, more simpler and moderate structures have already been demonstrated in new public cemeteries in Kuala Lumpur metropolitan such as S9MC and TSMC. In this way, the amount of space occupied by kepek structures has been reduced and minimized, allowing for effective use of space.

V. CONCLUSION

There is no doubt that existing cemeteries have made a significant contribution to the increasing levels of biodiversity in the city. The design of urban cemeteries should continue to underpin on-going sustainability within the city. However, urban cemeteries could offer so much more to the wider public. Malaysians should be permitted to use urban cemeteries as an alternative to their outdoor recreational

APPENDIX

	Public Cemeteries in Kuala Lumpur					
	Jalan Ampang Muslim Cemetery at Titiwangsa, Kuala Lumpur (JAMC)	Jalan Kuari Muslim Cemetery at Cheras, Kuala Lumpur (JKMC)	Jalan Damansara Muslim Cemetery at Segambut, Kuala Lumpur (JDMC)	KL-Karak Muslim Cemetery at Batu Kuala Lumpur (KLKMC)	Section 9 Muslim Cemetery at Kota Damansara, Petaling Jaya (S9MC)	Muslim Burial Section at Taman Selatan Memorial Park, Putrajaya (TSMC)
1. Site location - Neighbourhood context outside cemetery's perimeter - Is it located close or further from the settlement?	- The site is surrounded by skyscrapers and busy highways - The cemetery has been separated from its main settlement area by a busy highway, which is run across them.	- The site context comprise of a large Christian cemetery, a hospice, a religious school and a mosque. - The cemetery is located close to the residential area.	- Two major busy highways surround a third of the quarter of the site. - Another quarter of the site is exposed to high-rise condominiums, which located across the road.	- The site is located in between industrial and residential area. - An orphanage hostel was centrally situated within this cemetery's area,	- A reserved forest surrounds most of the site. - The settlement is located nearby to residential and community park.	- The site is part of public park network which located at the city's South end of Putrajaya - The site is intended for allocation in a far distant from any settlements.

	Public Cemeteries in Kuala Lumpur					
	Jalan Ampang Muslim Cemetery at Titiwangsa, Kuala Lumpur (JAMC)	Jalan Kuari Muslim Cemetery at Cheras, Kuala Lumpur (JKMC)	Jalan Damansara Muslim Cemetery at Segambut, Kuala Lumpur (JDMC)	KL-Karak Muslim Cemetery at Batu Kuala Lumpur (KLKMC)	Section 9 Muslim Cemetery at Kota Damansara, Petaling Jaya (S9MC)	Muslim Burial Section at Taman Selatan Memorial Park, Putrajaya (TSMC)
2. Area (Ha)	5.2	2.2	8.0	32.8	20.2	82.2
3. Graves arrangement - How can people identify their graves? - Is there any systematic guide used like sections and block?	<ul style="list-style-type: none"> - Graves are found to be unaligned and not paralleled to geometrical layout. - Some old graves are not even oriented towards the direction of (Kiblat) Mecca. - Visitors have to rely on their memory in order to trace for their grave. 	<ul style="list-style-type: none"> - Graves are found to be unaligned and not paralleled to geometrical layout. - The later graves are found scattered in between the former. - Visitors have to rely on their memory in order to trace for their grave. 	<ul style="list-style-type: none"> - Graves are found loosely aligned and not paralleled to geometrical layout. - The method of Silang Tikar that has been implemented here is found to be ineffective. - Visitors have to rely on their memory in order to trace for their grave. 	<ul style="list-style-type: none"> - Graves are found closely aligned and paralleled to geometrical layout. - The method of Silang Tikar that has been implemented here is found to be ineffective. - Visitors have to rely on their memory in order to trace for their grave. 	<ul style="list-style-type: none"> - Graves are found closely aligned and paralleled to geometrical layout. - The method of Silang Tikar is still being practice at this cemetery. - Visitors have to rely on their memory in order to trace for their grave. 	<ul style="list-style-type: none"> - Graves are systematically arranged and divided into rows defined by the internal footpath. - Signage plaque located at every burial sections are use to indicate the row numbers. - The signage should be able to assist visitors in tracing their graves during visitation.
4. Grave practices - Any existence of material culture and personal attachment? E.g. fencing, decorative pebbles. - Element of traditional practices e.g. white cloth wrapped around the gravestones, family plots, shrubs planting	<ul style="list-style-type: none"> - Material culture and personal attachment were flourishing heavily. - Most of Malay traditional practices over the graves can be found inside this cemetery. 	<ul style="list-style-type: none"> - Material culture and personal attachment were flourishing heavily. - Most of Malay traditional practices over the graves can be inside this cemetery. - People were given lots of freedom in performing ritual over the graves. 	<ul style="list-style-type: none"> - Material culture and personal attachment were flourishing heavily. - Most of Malay traditional practices over the graves can be found inside this cemetery. - People were given lots of freedom in performing ritual over the graves. 	<ul style="list-style-type: none"> - Material culture and personal attachment were getting less than the later cemeteries but they can still be found around. - Most of the traditional practices over the graves have been closely monitor and put to minimise. - People were given freedom in performing ritual over the graves, however the kepek structures has being strictly minimise. 	<ul style="list-style-type: none"> - Material culture and personal attachment were getting less than the later cemeteries but they can still be found around. - Most of the traditional practices over the graves have been closely monitor and put to minimise. - People were given freedom in performing ritual over the graves, the kepek structures has been minimise. 	<ul style="list-style-type: none"> - Material culture and personal attachment were getting less than the later cemeteries but they can still be found around. - Most of the traditional practices over the graves have been closely monitor and put to minimise. - People were given freedom in performing ritual over the graves, the kepek structures has been minimise. Over some graves, kepek are completely absence, leaving only the gravestones.

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	Jalan Ampang Muslim Cemetery at Titiwangsa, Kuala Lumpur (JAMC)	Jalan Kuari Muslim Cemetery at Cheras, Kuala Lumpur (JKMC)	Jalan Damansara Muslim Cemetery at Segambut, Kuala Lumpur (JDMC)	KL-Karak Muslim Cemetery at Batu Kuala Lumpur (KLKMC)	Section 9 Muslim Cemetery at Kota Damansara, Petaling Jaya (S9MC)	Muslim Burial Section at Taman Selatan Memorial Park, Putrajaya (TSMC)
5. Topography - Flat / undulated / hilly - Terraced	Burial spaces were built on a level ground.	Burial spaces were relatively built on depress ground which has been levelled with partially undulated slope on one side.	Burial spaces were built over the hill ground, which has been levelled.	Burial spaces were built on level ground with a river running through it.	Burial spaces were built over the hillground, which has been levelled.	Burial spaces were built on a level ground.
6. Drainage system - How is the running water being channel out?	Surface drainage and subsurface drainage	Surface drainage and subsurface drainage	Surface drainage	Surface drainage	No drainage system exist	Subsurface drainage
7. Vegetation - Trees and shrubs maturity, grass areas, natural areas - Is the current condition possessed some park quality?	Mature trees and shrubs, grasses grow between graves. - Posses park quality.	Mature trees and shrubs, grasses grow between graves. - Does not posses park quality.	Mature trees and shrubs, grasses grow between graves. - Posses garden quality	Immature trees and shrubs, grasses widely grown between graves. - Does not posses park quality.	Immature trees and shrubs, grasses grown between graves. - Does not posses park quality.	Mature trees and shrubs, grasses widely grown between graves. - Structured planting was established to compliment with the park theme.
8. Softscape (graves) - Ethnobotanical value - Type of trees and shrubs	Various types of trees and shrubs were planted over the graves.	Various types of trees and shrubs were planted over the graves.	Various types of trees and shrubs were planted over the graves.	Common types of shrubs were planted over the graves.	Common type of trees and shrubs were planted over the graves.	Common types of shrubs were planted over the graves.
9. Spatial relationship - Interconnection within the cemetery between graves and circulation. - Is the condition allowed for funeral ceremony to take place at ease?	Internal circulation does not direct users to their graves. - The spatial condition will hinder for funeral ceremony to take place at ease.	Internal circulation does not direct users to their graves. - The spatial condition will hinder for funeral ceremony to take place at ease.	Internal circulation does not direct users to their graves. - The spatial condition will hinder for funeral ceremony to take place at ease.	Internal circulation does not direct users to their graves. - The spatial condition allowed for funeral ceremony to take place at ease.	Internal circulation direct users to their graves. - The spatial condition allowed for funeral ceremony to take place at ease.	Internal circulation direct users to their graves. - The spatial condition allowed for funeral ceremony to take place at ease.

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10. People activities - What sorts of activities exist?	- People were hardly seen around the cemetery for graves visit.	- Several people were seen around the cemetery for graves visit.	- A few people were seen around the cemetery for graves visit. - Maintenance workers were seen around.	- A few people were seen around the cemetery for graves visit. - Maintenance workers were seen around.	- Several people were seen around the cemetery for graves visit. - There were funerals taking place during the site visit.	- People were hardly seen around the cemetery for graves visit. - Maintenance workers were seen around.
11. Facilities provided - Availability of visitors parking, WC, seating, dustbin, lighting - Does it have a good accessibility for burial and visitation? - Does it cater for the graves' ritual?	- Basic facilities related to funeral rites are being provided.	- Basic facilities related to funeral rites are being provided. - Access to burial plots can be difficult due to absence of footpath and overcrowding.	- Basic facilities related to funeral rites are being provided. - Access to burial plots can be difficult due to loose footpath; overcrowding as well as poor visibility that derived from heavily planted shrubs.	- Basic facilities related to funeral rites are being provided. - Access to burial plots is fairly easy even though there is no footpath because the graves found to be arranged in a systematic order.	- Complete facilities related to funeral rites are being provided. - Access to burial plots is possible as there is a clear footpath being provided. However the footpath was being laid out right after the graves plots have been use for burials.	- Complete facilities related to funeral rites are being provided. - Access to burial plots is very clear and direct. There is a clear indication between primary and secondary footpath. As well as between internal and external footpath.
12. Perimeter boundary - Does it allow for future extension?	- A brick walls with one main entrance and two secondary surrounds cemetery areas. - Land extension for burial is not possible.	- Cemetery area is surrounded by a combination of concrete walls and fence with one main entrance and three secondary. - Land extension for burial is not possible.	- Cemetery area is surrounded by a combination of concrete walls and a lower fencing with buffer planting. There is only one main entrance exist. - Land extension for burial has been allocated from the early beginning.	- Cemetery area is majorly surrounded by concrete walls, which block view from the outside. There are two main entrance exist. - Land for burial has been allocated in phases and they will be use in stages.	- Cemetery area is majorly surrounded by concrete walls, which block view from the outside. There is only one main entrance exist. - Land for burial has been allocated in phases and they will be use in stages.	- Cemetery area is partially surrounded by fencing walls, which still allow the view from outside. The main entrance is part of the motorist road network. - Land for burial has been allocated in phases and they will be use in stages.

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<p>13. Degree of openness</p> <p>- Does it shrouded by vegetation?</p> <p>- Sunlight exposure</p>	<p>- Big mature trees cover almost whole area in shades.</p> <p>- Shady and breezy atmosphere offer pleasant respite from hot temperature outside.</p>	<p>- Clumps of trees found to be grown scattered which allow huge amount of sunlight to penetrate over the site.</p> <p>- The site become warm very quickly early in the day.</p>	<p>- Widely planted trees and shrubs have created a dense atmosphere within the site.</p> <p>- Tolerable amount of sunlight cast over the site.</p>	<p>- Fewer varieties of shrubs were found at the site with trees being planted at specific interval.</p> <p>- Intolerable amount of sunlight cast over the site.</p>	<p>- Fewer varieties of shrubs were found at the site with trees being planted at specific interval.</p> <p>- Intolerable amount of sunlight cast over the site.</p>	<p>- Varieties of trees and shrubs have been carefully planted over the site, which are also use to define the space between burial sections.</p> <p>- Tolerable amount of sunlight cast over the site.</p>
<p>14. Accessibility</p> <p>- How far can motorists and the hearse get through inside the cemetery?</p>	<p>- Visitors have to park outside the cemetery's wall.</p> <p>- A hearse can only reach up to the facilities building but not through the burial ground.</p>	<p>- Visitors have to park outside the cemetery's wall.</p> <p>- A hearse can reach up to the facilities building and along the main internal road.</p>	<p>- Visitors' parking is found to be within the cemetery's wall but they are limited and located only at certain spots.</p> <p>- A hearse can reach up to the facilities building and several dropping zones were allocated.</p>	<p>- Visitors are able to park along the road inside the cemetery.</p> <p>- A hearse can reach up to the facilities building and the dropping point can be done along the internal road.</p>	<p>- Visitors are able to park at the facilities building or along the road inside the cemetery.</p> <p>- A hearse can reach up to the facilities building and the dropping point can be done along the internal road.</p>	<p>- Visitors are able to park at the facilities building or at the parking lots provided throughout the cemetery area.</p> <p>- A hearse can reach up to the facilities building however there is no dropping point been allocated</p>
<p>15. Grave's spatiality</p> <p>- Is there any space allocated for visitors to perform the ritual and recite their prayer?</p>	<p>- Spaces are very tight for visitors to perform on their ritual practices over the graves due to overcrowding.</p>	<p>- Spaces are extremely tight for visitors to perform on their ritual practices over the graves due to overcrowding.</p>	<p>- Spaces are found to be varying from loose to tight for visitors to perform on their ritual practices over the graves.</p>	<p>- Spaces are reasonably spacious for visitors to perform on their ritual practices over the graves.</p>	<p>- Spaces are fairly reasonable for visitors to perform on their ritual practices over the graves.</p>	<p>- Spaces are tight for visitors to perform on their ritual practices over the graves.</p>

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16. Hardscape (graves) - Material used e.g. tiles, cement or - Is the kepek making process done through traditional method or prefabricated?	- Varieties of material used for the grave's structures from concrete, granite to natural stones, as well tiles including marble and terrazzo - Traditional style of making kepek is dominant.	- Varieties of material used for the grave's structures from concrete, granite to natural stones, as well tiles including marble and terrazzo - Traditional style of making kepek is dominant.	- Varieties of material used for the grave's structures from concrete, granite to natural stones, as well tiles including marble and terrazzo - Traditional style of making kepek is dominant.	- Material used for the grave's structures has begun to be monitor over by the management. People are expected to observe the cemetery's regulations. As a result the colour and dimension of kepek has also been standardise. - Traditional style of making kepek has been simplified and replace by a modest looking kepek.	- Material used for the grave's structures has been regulated from early beginning by the management but somehow people are still preferred to have it their way. - Traditional style of making kepek is still dominant and prefabricated kepek are also found to be around.	- There is not much material used in this cemetery due to restriction from the management. Some graves do not have any build structure over them. This has diminished the unique characteristic found over Malay graves. There is no longer personal attachment found over the graves made by the bereaved. - Traditional way of making kepek has been eliminated and taken over by ready-made kepek.

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