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TROPICAL URBAN PARKS IN KUALA LUMPUR, MALAYSIA: CHALLENGING THE ATTITUDES OF PARK MANAGEMENT TEAMS TOWARDS A MORE ENVIRONMENTALLY SUSTAINABLE APPROACH

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Highlights

- Parks in tropical cities have potential to help urban ecosystem service delivery, but this means largely a change in current planting design and management
- New design/management will involve more environmentally sustainable practices, but there may be socio-political resistance to this, as it contravenes the desire to retain and extend 'gardenesque' landscapes.
- Overall, park management and maintenance teams believe change will be difficult due to pressures from the visiting public, but attitudes varied somewhat across the different tiers of management.

Introduction

Globally, the demand for natural resources to meet the needs of urban development and rising global population is exceeding the available biocapacity. Galli (2015) reported an almost 140% increase in demand for natural resources from 7.6 to 18.1 billion global hectares between 1961 to 2010. Such pressure results in loss of biodiversity and degradation of ecosystem service

provision (Butchart et al., 2010; Tittensor et al. 2014). As concerns over environmental issues have become more critical, there has been a strong movement in developed countries towards more environmentally sustainable landscape practices. Amongst other agendas, these recognize the potential role of public green spaces to address the environmental challenges of highly urbanized cities and to help mitigate some of the problems associated with climate change. For example, urban green spaces, such as parks, can help reduce the effects of urban heat islands (Haq, 2011), reduce flooding and water pollution (ATSE., 2010; Cameron & Hitchmough, 2016), and help to off-set the decline of other green spaces, by providing habitat for wildlife (Heidt & Neef, 2008; Wilby, 2007). This is in addition to their role in providing leisure and recreational facilities to fulfil the demands of a growing urban population (Chiesura, 2004).

At the park level, there is also an urgent need to shift conventional landscape practice to adapt to the changing environment in our cities (Morgan, 1991). In response to the environmental challenges, current landscape practices may no longer be appropriate for managing urban parks because of their dependence on high levels of maintenance (Cranz & Boland, 2004; Hitchmough & Dunnett, 2008), which is costly (Justice, 1986), and potentially damaging to the environment through consuming "huge amount of resources in energy for machinery, irrigation and fertilizers" (Smith et al., 2008). Therefore, being at the larger scale of managed public green space, it is essential for park managers to adapt their landscape management practice towards more environmentally sustainable methods and to utilise natural resources more efficiently. Although delivering more environmentally sustainable approaches (ESA) to urban park management could potentially contribute towards a city's sustainability, the level of adaptation for each park should vary according to the local setting and contextual background (Haq, 2011).

Changing the roles and function of landscape will impact on the way people perceive these new landscapes (Antrop, 2005; Nassauer, 1995). Cranz & Boland's (2004) study of sustainable parks identified an emerging new trend between 1982 and 2002 that indicated a new appetite among landscape practitioners in delivering more environmentally sustainable practices. Similarly, Makhzoumi (2000) suggests that through a better understanding of ecology and the adoption of ecosystem sensitive approaches could potentially shift the current landscape towards a more sustainable practice with higher environmental value, while also being acceptable to the public. However, Lovell and Johnston (2008) argue that despite their benefits in providing ecosystem

services, this change in approach may create challenges for those involved in managing these landscapes (Calkins, 2005) and the public (Nassauer, 1995a). Such changes will affect the overall landscape design, spatial form, character and maintenance of the parks, as it will create a different landscape style and a new aesthetic (Cranz & Boland, 2004), which may differ from familiar landscapes of the past. Imposing changes on the current landscape practice of urban parks may provoke both positive and negative reactions among the park management and ground staff, who must adapt to new methods and communicate these changes to park users. Understanding the attitudes of managers and ground staff towards more ESA is essential if these ideas are to be adopted and applied effectively.

Environmentally sustainable approach to managing Kuala Lumpur's urban parks – A unique challenge

Malaysia was a former British colony until it gained independence in August 1957. The colonial period had a major influence in shaping the planning, design and management of parks in Kuala Lumpur, which were heavily influenced by a "Picturesque and Gardenesque" landscape style. This legacy and aesthetic has continued to have an important bearing on the Malaysian Government's vision of becoming a "Garden Nation" by 2005 initiated by the former Prime Minister Tun Dr. Mahathir Mohamed in 1997 (Tahir, 2005). This vision was revised in 2006 to become the "Most Beautiful Garden Nation" by 2020 (National Landscape Department, 2011).

Focusing on landscape beautification has sustained the continuation of intensive landscape maintenance in Kuala Lumpur's urban parks. Irrigation throughout the dry season is typical and footpaths and paved areas are also frequently washed using potable water. To maintain a manicured and 'beautiful' aesthetic, regular mowing and annual bedding schemes are also common practice. Kuala Lumpur City Hall (KLCH) has invested millions of Malaysian Ringgit for urban landscape development in supporting the vision of a "Most Beautiful Garden Nation" (Ibrahim, 2016), mostly for new parks and refurbishment (Tahir, 2005). The KLCH commitment continues with RM 13.2 million (€28 million) allocation for the 2017 budget for the city's landscape beautification (Bernama, 2016, November 15). Nevertheless, as this amount

may continue to increase to meet on-going and escalating costs to maintain urban parks, it is necessary for the current management practices to adapt in order to address this increasing financial burden (Justice, 1986).

Whilst maintenance costs continue to escalate, there is also a growing pressure on government resources to cope with the rapid urbanization and population growth in Kuala Lumpur. The rate of urbanization in Malaysia is expected to increase to 70% by 2020 (Rosni et al., 2016). A major impact of this growth is increased demand for clean drinking water, a resource which is in short supply. Yet potable water is still being used throughout the dry season to irrigate and cleanse public parks (Malaysian Water Partnership, 2001). Using drinking water for this purpose is both costly and also threatens the water supply to a growing urban population (Mohd et al., 2011).

In a country where there is such a dramatic change in rainfall between the dry and wet seasons, the monsoons bring an increased likelihood of flooding for a city located on a floodplain (LESTARI., 1997). Urban expansion and climate change have further exacerbated this problem (Mohan et al., 2010). An analysis of seasonal rainfall between1980-2010 shows a trend towards extreme rainfall intensity in the west coast region that has resulted in frequent flash floods (Suhaila et al., 2010). In response, the Malaysian Government has adopted largely engineering based solutions to address this challenge. In 2004 the Stormwater Management and Road Tunnel (SMART Tunnel) Project was implemented in Kuala Lumpur, at a cost of RM1.9 billion (€400 million) by the Department of Irrigation and Drainage (DID) and Malaysia Highway Authority (ITA-AITES, 2011; SMART Control Centre, 2014). At times of flooding the tunnel is closed to traffic and used to create temporary storage for storm water. Despite this investment, flooding remains a problem. Whilst many cities are now looking to adapt or develop new urban parks and open spaces to create additional storage capacity and to help mitigate against flooding. For example, in Paris Parc de Billancourt, designed by Agency Ter in 2006 conceptualises the park as a series of connected islands in times of flood (Agence Ter, 2017). The potential to use parks as storm water capacity have not yet been considered in Kuala Lumpur.

This paper explores an expanded role for Kuala Lumpur's urban parks that challenges the current vision that focuses on beautification in order to deliver more ESA. Here, we define this approach not in terms of specific plant communities and ecology but instead the introduction of a more relaxed and less intensively managed landscape where there is greater complexity of vegetation and a significant reduction in irrigation, mowing, pruning and cleaning of hard surfaces. The research aims to understand how this change would be received by park management and ground staff; and in the context of tropical urban parks, if this relaxation would present different challenges and opportunities when compared to parks in temperate climates.

Methods

Case studies selection

Five case study sites were identified in order to capture the scale and complexity of urban parks within the Kuala Lumpur in terms of their: status and size, age, location and context (Table 1). The Kuala Lumpur structure plan 2020 and planning standard for open spaces (GP005-A) identifies a hierarchy of spaces that includes; city, district, neighbourhood and local parks.

In Fig. 1, city parks represent the greatest level of investment and maintenance and attract the largest number of visitors. In comparison to generally much smaller local parks, city parks also include a wider range of landscape functions and typologies, for example, open woodland, extensive mown lawns, lakes, play areas. Age was also considered to be an important variable in determining how well established the vegetation and management practices and also the ideas that originally informed the design and layout of the park. For example, the Botanic Garden is the largest and oldest park in Kuala Lumpur and was originally set out during the British Colonial period. Following independence in 1957 there have been major changes to the park in line with the beautification programme and more recently a series of themed gardens have been introduced. Choosing sites that represented different contexts and therefore user groups was also considered to be important. Whilst this research does not directly engage with park users, we were keen to understand how park managers and ground staff reflected on the impact that

these changes would have on the different communities they served. For example, the Botanic Garden is an important tourist attraction and serves a more prosperous local community. Its catchment is therefore very different to some of the local parks that formed part of this study and are located in the suburbs.

Interview Sample

In order to understand the implications of moving towards more ESA, it was important that the research engaged with the full range of staff responsible for managing and maintaining public parks in Kuala Lumpur. Our sample of 37 participants included senior management staff that had responsibility for strategic planning and policy for all the parks in Kula Lumpur and the management and maintenance teams that were attached to each of the five case studies. Fig. 2 shows the hierarchy of park management in Kuala Lumpur. At each park there were interviews, respectively with i. senior management personnel, ii. managerial staff, iii. support staff and iv, ground staff. Obtaining the views of ground staff was considered to be extremely important, as they would be directly tasked with implementing any changes.

It was anticipated that as a consequence of lower educational attainment that ground staff would not be familiar with the changes that were being proposed but would bring a wealth of practical knowledge and experience of maintaining tropical urban parks. Ground staff would also provide a valuable insight into the reaction of park users to the proposed changes because of their daily contact with visitors.

Interview questionnaire design

The assessment of urban park management attitudes towards a more ESA was conducted through semi-structured interviews with photo-based questions. An interview topic guide was developed based on the case study protocol by Yin (2009) to give some flexibility in seeking information from the respondents. According to Bignante (2010), photo elicitation is a widely

used method in interviews, using the images to assess respondents' opinions and attitudes towards the topic being studied. The use of photos as image representation has proven to be an effective tool in learning about stakeholders' attitudes and preferences in landscape studies, with both expert and non-expert respondents (Kaplan, 1985; Kaplowitz & Lupi, 2012). The use of digital manipulation represents various types of landscape treatment in images to "facilitate respondents' understanding of complex or new concepts such as landscape changes" in their local context (Sullivan et al., 2004, cited in Kaplowitz & Lupi, 2012, p. 365).

The photo-based questions consisted of images taken at each of the five case study sites for a range of different landscape settings (Fig. 3). These included: lawn, parkland, semi-woodland and water's edge. These landscape typologies were selected because they were typical of each of the five case studies and also presented an opportunity to introduce greater diversity and complexity of vegetation and to relax the existing maintenance. For each of the five case studies the existing landscape condition was set alongside two alternative designs that included a moderate treatment (Alternative 1) and a more intense treatment (Alternative 2). The images were edited using Adobe Photoshop CS6 Extended software. In making the transition to a more sustainable approach it was important that managers and ground staff could contextualise their response by seeing how the proposed changes would impact on a landscape that they were familiar with and not a generic representation.

Data analysis

The data was analysed using the technique of explanation building (Yin, 1984). Multiple sources of evidence, which included site observation and documentation, were used to support and validate the interview findings as triangulation (Yin, 2009). The results between different study sites were compared to identify factors that influence park management, support staff and ground staff attitudes towards the proposed changes.

Results and Discussion

The results are presented and discussed in two parts, first, the results on the attitude of the different level of urban park management staff towards more ESA to managing urban parks in

Kuala Lumpur. This is followed by a comparative discussion of the findings from the semi-structured interviews across the case studies in response to their different age, scale and context.

Attitudes of urban park management towards more environmentally sustainable approach to managing Kuala Lumpur's urban parks

Three key themes emerged from the analysis of the results of park management staff and ground staff towards a more ESA to managing urban parks in Kuala Lumpur. Firstly, the potential of an environmentally sensitive approach to enhance the 'wild beauty of the parks' and its wider environmental benefits. Secondly, a concern, especially amongst ground staff, that this change in approach would conflict with visitor's expectations of a clean and tidy park. Thirdly, that a wilder and denser vegetation would compromise the health and safety of visitors and ground staff. Each of these issues are considered in more detail.

Consistent with previous studies, over half of the urban park management staff agreed that a more environmentally sustainable approach could enhance the multifunctional role of urban parks (Dunnett & Clayden, 2007; Lovell & Johnston, 2008; McGuckin & Brown, 1995). Senior management (*SM*) and park managers (*PM*) and assistant park managers (*APM*) across the five parks recognised the potential contribution to storm water management through the introduction of sustainable drainage systems (SuDS) and more complex, multi layered vegetation. *PM* and *APM* at city, district and local parks also recognised the benefit in relaxing the maintenance levels to enhance the regeneration of vegetation within their park and to increase the scale and diversity of different habitats. *PM(s)* at the Botanic gdn, Titiwangsa gdn and Kiara Valley also highlighted the benefits in mitigating urban heat islands by increasing the amount of shade and evapotranspiration cooling through more extensive and complex vegetation cover. This observation is perhaps most pertinent given that both the Botanic gdn and Titiwangsa gdn are located within or near to the city centre where temperatures are most extreme.

With regard to the different landscape typologies and intensity of treatment, *SM*, *PM* & *APM* identified the shrubland, semi woodland and water's edge as those areas where the greatest benefit could be achieved. They expressed a preference for the more intense treatment for these

settings as planting complexity could be readily increased, and any areas of close mown grass within these areas could be eliminated or the extent of mowing radically reduced. The overall consensus was that changes in these locations would have greater visual impact and enhance the natural beauty of the park. Lake edges were commented on by one of the senior managers as an opportunity to create a more naturalistic aesthetic by 'by creating layers and density [of planting] that enhanced the natural look of the water's edge' (NLD1). The current practice is for the water bodies to have formal edges, with close mown grass right up to the edge of the water, which requires frequent mowing.

SM, *PM* & *APM* however, were less enthusiastic about either of the alternative treatments for the larger areas of formal lawn, especially where these were adjacent to footpaths. The overall consensus was that in order for these changes to gain public acceptance there needed to be a clear gradient and distance between those areas that promoted a more ESA and those areas that the public would frequently access for recreation. As noted by one of the senior management staff:

> *"Hierarchy is important, keep lower plants for areas closer to the pathway and gradually increase the height for background planting, so it becomes a backdrop.* (LD3)

Management staff who operate across the city and at each park were concerned that whilst there maybe public approval for improving the environmental performance of the park a move towards a more dynamic and potentially messier landscape would conflict with existing expectations concerning neatness and order – an aesthetic that has been reinforced by government and its long term ambition to create 'the Most Beautiful Garden Nation'.

Whilst there was broadly a positive response from the management team towards the environmental benefits, the ground staff and to a lesser extent the support staff were far more critical of the proposed changes to deliver an ESA (Fig. 4). Ground staff (*GS*) and support staff (*SS*) have the most contact with the public and arguably are more attuned to their responses to any changes within the park.

Across the five case studies the GS expressed a range of concerns of what they perceived to be in each of the alternative proposals a more messy and less well tended landscape. A member of

ground staff at the Botanic gdn commented that the public '*don't like bushy landscape; they prefer a clean-cut landscape" (*PBG12). Whilst ground staff at Ampang gdn, Kiara Valley and Permaisuri gdn all commented that the public would not want dense, untidy shrubbery in the park (ALG3, KVP4, and PLG2). This concern regarding the need to maintain a 'clean cut' landscape that was not over crowded or too 'dense' also aligned with their concerns over the potential loss of important scenic views within the park.

Whilst the *GS* were broadly critical of all the proposed changes on the basis of untidiness and that there would be complaints from the public there was some muted acceptance for changes to areas of semi woodland. At Kiara Valley it was suggested that alternative 1 might enable visitors to be more aware of the wildlife in the park (KVP3) and at Ampang gdn the replacement of mown lawns with a denser ground cover would be tidier (ALG1) and simpler to maintain. Whilst there was broader acceptance amongst *GS* for the changes in the semi woodland, *GS* at Ampang gdn suggested that this should not happen near to entrances as '*people might be put off by its unattractive appearance'* (ALG2). *GS* at the other parks also suggested that this treatment would be most appropriate in areas that are closer to existing nature or that are less frequently visited.

Although the response from *SS* was similar to the *GS*, they were generally more positive and willing to compromise on the introduction of moderate treatment 1 across a range of different settings, provided that this did not compromise the existing aesthetic of being beautiful, clean and tidy. As noted by a member of the *SS* at Titiwangsa gdn:

> *"As long as the landscape is beautiful and clean, our public will not complain. So, species selection is important. I have seen a local grass species displayed at the FLORIA [local garden show]. That species has potential to create a nice view, the public may love it."* (TLG5)

This reveals the importance of maintaining or even enhancing the existing landscape aesthetic. Several *SS* were concerned that some visitors would reject any move towards a more ESA because of the perception that this would lead to less ordered and more untidy landscapes. A member of the support team at Ampang gdn commented:

"Usually, the visitors expect this park to be clean and tidy. If they see this [lawn treatment 1 & 2], they will make a complaint…I prefer Alternative 1, but it needs to include attractive plants and flowers. It would be nicer if we planted Portulaca *spp. [Japanese rose ideal for groundcover] along the walkway."* (ALG3)

This suggests that from the perspective of the *SS* that the public would be more accepting of a change in planting and maintenance provided that it appeared visually attractive and did not compromise the clean and tidy appearance of the park. Interestingly in contrast to the *SM*, *PM*, *APM* and *GS*, there was acceptance amongst the *SS* for the introduction of a modified treatment 1 for lawn areas in each of the parks with the exception of Titiwangsa gdn. Reasons for this are unclear but may suggests that by including more visually attractive plants this would be an opportunity to deliver environmental benefit but more importantly to enhance the beautification of the park and arguably strengthen the government aspiration to create 'the Most Beautiful Garden Nation'. The aspect of introducing interesting and varied flower colour could be a key component here, as flower variety and colour has been shown to increase public acceptance of (untidy) flower meadows in urban parks within developed countries e.g. UK (Hoyle et al., 2017; Southon et al., 2017). Across each of the parks there was also a mixed, yet generally favourable response from support staff of introducing alternative 1 in areas of shrubland semi-woodland and water-edge treatment. A further reason for this change in attitude in *GS*, is simply that they themselves may find a more diverse landscape more interesting to maintain (Pepper, 2008; Parker & Bryan, 2017), despite some of the perceived drawbacks (see below).

Whilst there was concern at all staffing levels that the public would respond negatively to any changes that compromised a neat, clean and tidy appearance there were important differences between groups regarding the extent to which they would support these changes. Fig. 4 shows a breakdown of the different attitudes for each staffing group towards ESA. It indicates that *SM* and to a lesser extent *PM & APM* have a more positive response than the GS who are more sceptical about these changes. This is perhaps accounted for by differences in educational attainment and familiarity/exposure to more ESA to managing parks. Interviews with *GS*

revealed that they had very little or no understanding or experience of environmentally sustainable design, and how this might be used to address the challenges of flooding, loss of habitat and urban cooling. This lack of knowledge made their role of working in close contact with the public more challenging, especially if required to explain why these changes were necessary.

From the perspective of the *PM & APM*, any opportunity to help reduce on-going maintenance costs was very welcome. At *SM* level where there is a strategic responsibility for all parks and green spaces, the proposed changes had the potential to strengthen the remit for investment in public parks, especially where this elevated their importance beyond focusing on beauty to one of significantly contributing to ecosystem service provision for the city, e.g. reducing the severity of environmental challenges such as flooding, poor air quality and excessive heat (Cameron & Blanuša, 2016).

An issue that was consistently commented on by all levels of park management across each of the parks were concerns that adoption of ESA, would result in taller, denser vegetation that was less visually permeable and that this would raise issues of personal safety for park users. Whilst concerns regarding an increased threat of crime due to reduced sight lines are consistent with the experience of parks in temperate climates (Jansson et al., 2013) this may be further exasperated in tropical climates where evergreen plants are more typical and throughout the year will restrict sight lines (Hashim et al.,2016). Whilst it was not commented on by the project participants it is important to reflect on the difference in daylight hours between tropical and temperate latitudes, permeability of vegetation and what implications this may have regarding personal safety. The difference in day length between Kuala Lumpur and London at the summer solstice (21st June) is 4 hours 20 minutes, which increases to more than 5 hours when twilight is also included. In temperate climates therefore, daylight and visibility extends much later into the evening when vegetation is at its most visually impenetrable during the summer months. Hence, taking into account the significant differences in how vegetation performs in terms of defining spatial and visual enclosure, and how this translates to tropical climates will have important implications for vegetation strategies.

The interview data also revealed additional risks to health and safety in tropical urban parks that would not be experienced in many temperate climates and which may be further exacerbated by an ESA. Managers and ground staff were concerned that any increase in vegetation in relation to lakeside edges may increase breading sites for mosquitoes and the spread of disease. Similarly, pest-borne diseases, such as dengue fever (Dickin et al., 2014) and leptospirosis (bacterial infections) (Garba et al., 2018), are major public health issues in cities in Malaysia. Although there is no empirical evidence linking landscapes that may appear more 'nature-like' to an enhancement of this health threat, there is a perception that more diverse, structurally complex vegetation within the water features may encourage the breeding habits, and thus presence of, mosquitos, especially during the wet season. A point made worse if the ESA meant less overall maintenance of these water margins. A member of the *GS* at Permaisuri gdn shared his previous experience of dealing with this issue in relation to lake side edge treatments:

> *"This area was previously filled with aquatic plants. But the NGOs remarked that this site was becoming a mosquito breeding area. So, people were scared to come to this area. Now we are trimming the plants and clearing the area, people are starting to sit over there (*PBG12*).*

PM were also concerned that increasing planting density and ground cover would also increase the habitat for venomous snakes, a major concern for park visitors. A *PM* at Titiwangsa gdn commented:

> *"We are dealing with human attitudes. If we have this bushy landscape, they will be afraid of snakes and start to complain to us..."* (TLG4)

GS also raised a similar concern about venomous snakes and their safety when working in more densely vegetated areas. These concerns have been raised in other tropical/ semi-tropical countries, although educational programmes have been used successfully to offset local residents' fears and encourage safe use of such locations (Bonnet et al., 2016).

In summary, whilst there is broadly a shared concern across all layers of park management regarding the public response to what is seen as a less tidy aesthetic and also the potential health and safety risks associated with these changes there are also important differences in

responses/attitudes between management and ground staff. These differences appear to be related to i. educational attainment, ii. exposure to these alternative design and management approaches and iii. regular contact with park users. In the following section we go on to reflect on how differences between each of the case studies may influence their potential to accommodate a more ESA.

Response towards delivering more environmentally sustainable landscape practice across the case studies

The results from across the case studies show that adaptation to ESA is influenced by the park's age and size (Forman, 1995), and existing ecological capital (Lovell & Johnston, 2009). However, there was also evidence from the data that park location and context may have an overriding influence on the level of intervention that would be acceptable to *PM's*. This confirms the finding of previous studies that the appropriate ESA for Kuala Lumpur's urban parks is very much dependent on the park's setting and its function within the city (Wu, 2013).

The Botanic gdn (city park) is the oldest and largest park in Kula Lumpur and has a diverse range of habitats that in selected areas could be managed to develop more ESA. This also applies to the two district parks included in this study Titiwangsa gdn and Permaisuri gdn, which although half the size of the Botanic gdn and much younger, are similarly habitat diverse and could be adapted to increase their environmental function and ability to support a wider range of ecosystem services. For example, each of these parks include extensive areas of semi-open woodland which was identified by all *PM's* as one of the landscape settings that would be most appropriate for developing ESA. Increasing the complexity of planting in these areas will have less impact on visitors in terms of accessing these spaces, at least in comparison to the formal lawn areas, but may have implications for personal safety within the woodland and the need to maintain clear sight lines across such areas.

Whilst age, size and existing ecological complexity might suggest that management teams in the much larger and typically older city and district parks would be most responsive to adopting an ESA this was not the case. In reality, *PM's* and *GS* in these parks were sensitive to the parks'

locations and context and how this would impact on the primary park users. The Botanic gdn and Titiwangsa gdn are both located within the City centre and each have important social and recreational functions that attract significant numbers of visitors, including foreign tourists. The Botanic gdn has many attractions, in addition to its botanical collection and a historic legacy that recalls Malaysia's colonial past. However, perhaps more significantly, in the context of adopting an ESA, the Botanic gdn's role in projecting the Government's vision of Malaysia as 'The Most Beautiful Garden Nation' is vitally important. Thus, any changes that impacts on these particular parks aesthetic may be seen as compromising this vision.

It might be reasonable to assume that the *PM's* of the smaller peripheral parks located towards the edge of the city would be more receptive to the proposed changes. Whilst they may lack scale and complexity they are less constrained in terms their status and pressure of visitor numbers. However, the management teams for each of these parks were concerned that any changes that were seen to compromise user preference and expectations would be critically challenged by visitors. Despite these parks receiving less overseas visitors, and being located away from the busy city centre, they were still located in relatively affluent suburbs. As such, visitors tend to be composed of professional, educated and business classes, with perhaps more conservative and traditional attitudes to park management. The *PM's* expressed a view that it was their experience that such communities with higher social status and educational attainment would be more vociferous in expressing their concerns about any changes that occurred in the parks. Especially if these changes compromised the existing neat and tidy appearance and restricted space for recreational use.

Conclusion

This research highlights the challenges of translating environmentally driven landscape design and management practices that have been developed in very different political, social and climatic contexts to that of most tropical urban parks. Each country has its own unique history and trajectory but perhaps this is even more exaggerated when comparing Malaysia's comparatively recent history as an independent nation with those countries, located in temperate climates, where these ideas were first developed and applied. Interviews with senior

management and park management teams demonstrate an understanding of the expanded role that parks may fulfil in delivering wider environmental benefits and in helping to address many of the challenges that rapidly expanding tropical cities face in response to climate change, flooding and a need for urban cooling. This research, however, also reveals the unique challenges in translating these ideas to a tropical climate and flora. It specifically highlights concerns regarding public safety and changes to the visual permeability of parks where vegetation is less seasonally dynamic than temperate flora, and less visually permeable throughout the year. Respondents also identified additional health threats to visitors and *GS* where a more relaxed landscape management approach may promote habitat for mosquitoes and venomous snakes. The research also identified opinions from all staff, but especially *GS*, that the public would respond negatively to a less manicured aesthetic and where tidiness and cleanliness were deemed to be compromised.

Finding ways to educate and manage public perceptions thus allowing ESA to be adopted more effectively continues to be a significant issue in temperate parks (Jorgensen et al., 2002, Nassauer, 1995). In tropical parks and specifically Kuala Lumpur this challenge is arguably even greater. Tropical parks and their flora are less seasonally dynamic than parks in temperate climates. Park users are therefore less accustomed to dramatic changes in vegetation, for example the onset of Autumn and the 'mess' of fallen leaves that is a familiar experience for residents of temperate climates. In Malaysia iconic urban parks have been managed for more than a decade in response to the Government's vision that seeks to establish Malaysia as the 'Most Beautiful Garden Nation' (National Landscape Department, 2011), an aesthetic that is at variance with a less intensively manicured landscape. This paper not only highlights the difficulty of embedding stronger environmental approaches to land management in practice, when other political and social forces are at play, but in doing so acts as a metaphor for the wider tensions that exist between the need to embrace more radical sustainable lifestyles across the globe (e.g. Kareiva & Carranza, 201; Fullbrook, 2019) and the intransigence of the 'status quo' in terms of social attitudes, economic considerations and political will (e.g. Geden, 2016; Brulle & Norgaard, 2019).

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Fig.1. Location of selected case studies – (adapted from the Kuala Lumpur Structural Plan 2020 (Kuala Lumpur City Hall, 2004))

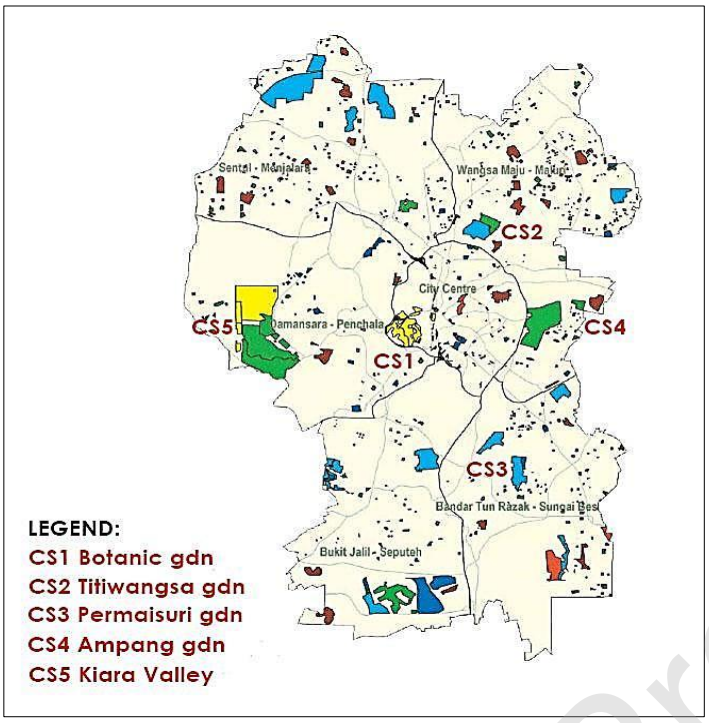

Fig. 2. Kuala Lumpur - Urban Park Management Structure

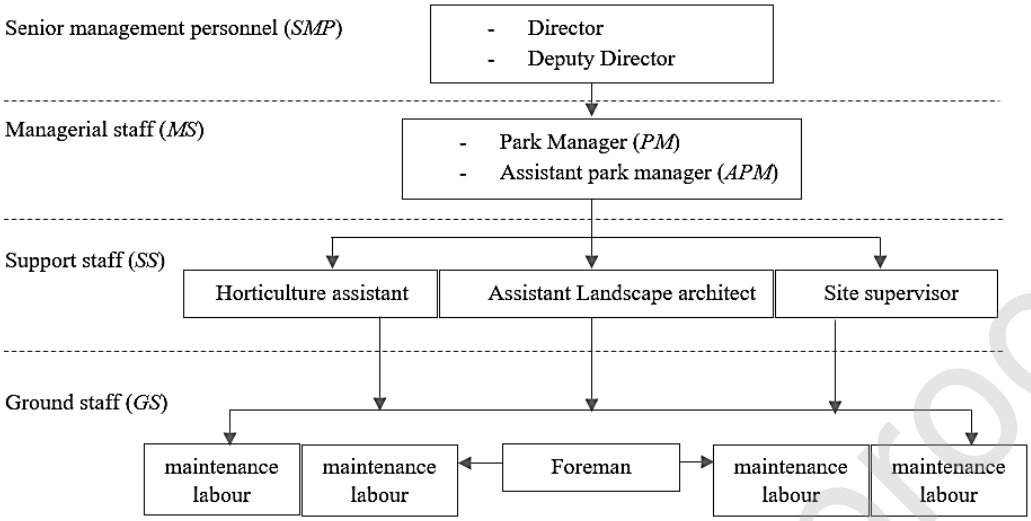

Fig. 3. An example of one of the case studies showing moderate and intense alternative treatment of an existing landscape using photo elicitation.

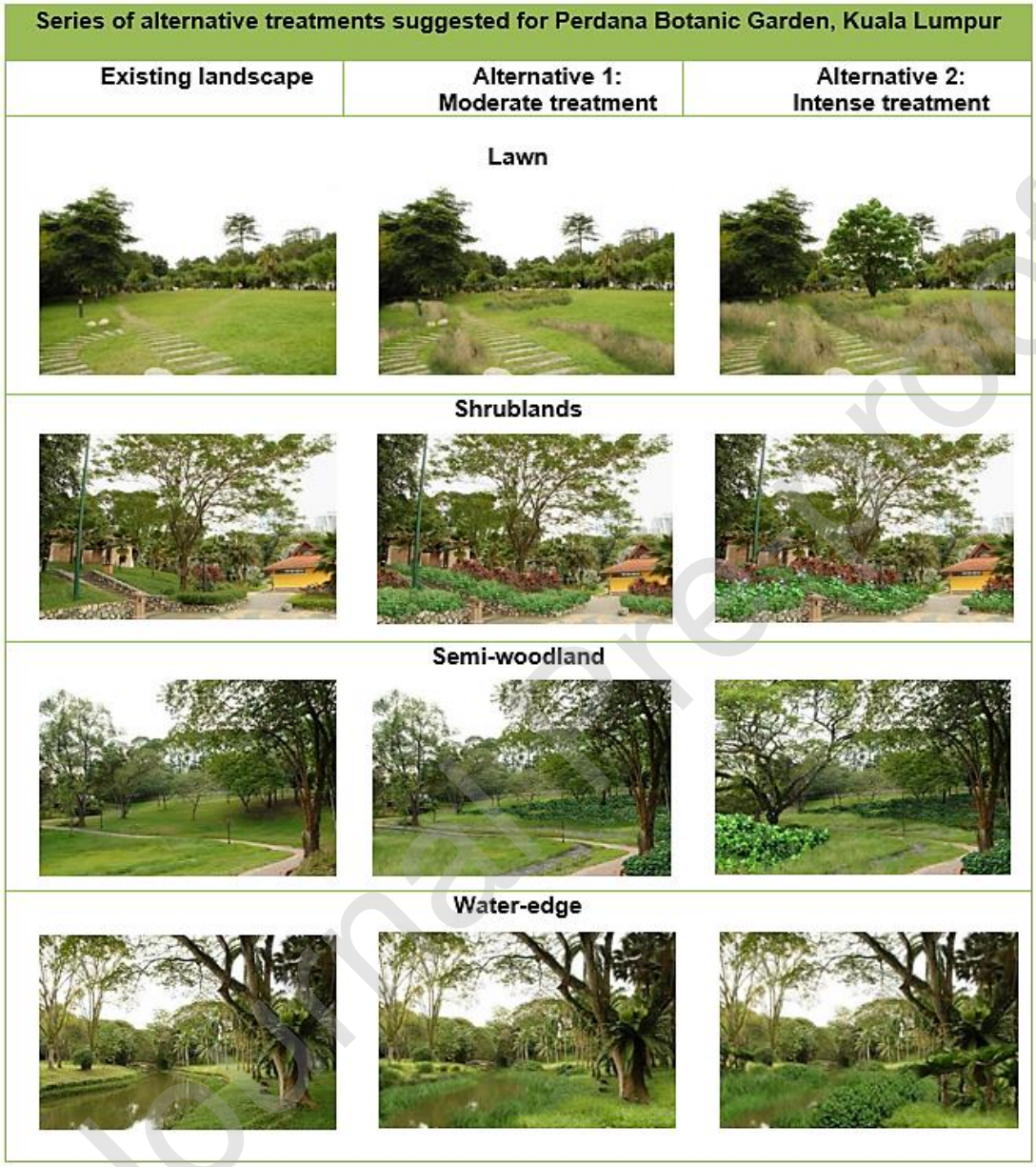

Fig. 4. Comparison of park management staff attitudes towards changing to an environmentally sensitive approach to landscape design and management. Individual respondents could express more than one view.

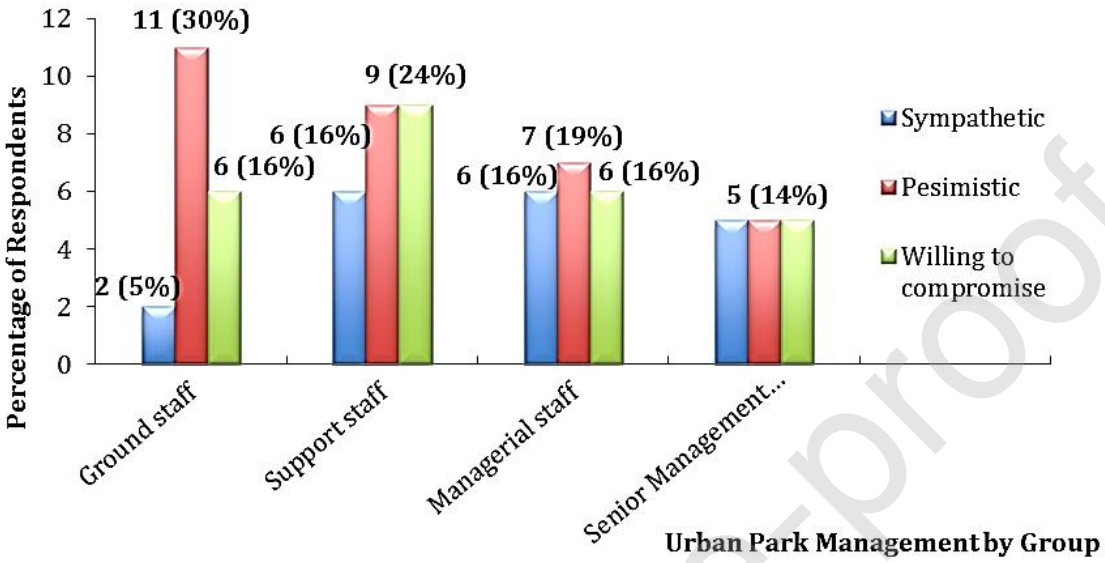

Table 1. Case study parks in Kuala Lumpur, their relative status within the City structure plan, year of opening and size.

Name	Hierarchy Status (Federal Town and Country Planning Department, 2013)	Year of Opening	Size (Ha)
Perdana Botanic Gardens (Botanic gdn)	City	1888	92
Titiwangsa lake garden (Titiwangsa gdn)	District	1980	46
Permaisuri Lake Garden (Permaisuri gdn)	District	1989	49
Ampang Hilir Lake Garden (Ampang gdn)	Local	2009	16
Kiara Valley Recreational Park (Kiara Valley)	Local	1975	16