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ENVIRONMENTAL ATTITUDE OF THE PEOPLE AND STAKEHOLDERS TOWARDS URBAN BIODIVERSITY IN KUALA LUMPUR, MALAYSIA

Zainul Mukrim Baharuddin [1] Rashidi Othman [2]

ABSTRACT

Urban biodiversity and wildlife management have been accepted as important ecological components of the urban environment. In Malaysia, very limited research has been undertaken in gaining an understanding of people's preferences towards biodiversity such as wildlife. Kuala Lumpur aims to promote and improve the quality of its living environment and to develop a sustainable approach for the development of urban green space. Thus, it is important to understand the attitude of people towards local urban parks and biodiversity especially wildlife and how it relates to the planning and development of green open spaces. The aim of this research is to explore the attitudes of stakeholders and residents towards urban biodiversity. The study used a three-step method. The first step was conducted to capture visitors' and stakeholders' understanding about their local urban public parks and biodiversity. The stakeholders expressed higher preference towards urban open spaces and wildlife. However, issues such as legislation were highlighted, responsibilities and awareness were still lacking at the decision and policy-making levels such as in the ministry and local authorities. The second steps were the observation survey to identify the abundance of urban wildlife and investigated the vegetation and habitat characteristics. The study found that the urban parks were dominated by common species of wildlife and had low numbers of native and protected species. The study also identified a similar pattern in urban park vegetation where native species were rarely found amongst the shrubs and the ground layers were less dense. This indicated that urban parks in Kuala Lumpur were artificially green with low numbers of native species. Finally, in the third step, a questionnaire survey was conducted to explore values, knowledge, attitudes and behaviour relating to urban wildlife. This study found that participants held strong emotional attachment to

wildlife. They held moralistic values on urban wildlife and vegetation. However, even though their attitude and values were positive, their knowledge of wildlife and behaviour towards it were low. These findings highlight the need for integrated approaches in urban biodiversity studies to improve urban biodiversity management in Kuala Lumpur with more appropriate, efficient and effective management.

Keywords: Urban biodiversity, Urban parks, Values, Attitude, Knowledge and Behaviour.

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INTRODUCTION

The urban population is growing rapidly around the globe especially in developing countries in South America, Africa and Asia. More than two-thirds of population is expect to be living in urban areas by 2050 (Muller & Werner 2010). Thus, because of the huge number of people living in towns and cities, it is important to promote a positive awareness towards urban biodiversity.

Huge efforts have been made regarding urban sustainability from Rio 1992 to recent years. The Curtiba Declaration in 2007 was the major step towards promoting the concept of 'Cities and Biodiversity'. At this convention, improving public awareness and educating future generations on the importance of protecting and conserving biodiversity were highlighted (Muller & Werner 2010). The following convention in 2008 moved a huge step forward in strengthening the role of local authorities in taking up active involvement to protect urban biodiversity within towns and cities. Although the recent issues that have been presented related to urban biodiversity, research has developed to investigate people's awareness, knowledge and behaviour towards urban biodiversity (Chace & Walsh 2006; Muller & Werner 2010).

"The aims of the Convention on Biological Diversity in the Curtiba Declaration 2007 were: 1) The conservation of biological diversity; maintaining the earth's life support systems and future options for human development, 2) The sustainable use of its components that means providing livelihoods to people, without jeopardising future options, and 3) The fair and equitable sharing of the benefits arising from the use of genetic resources" (Muller & Werner 2010, p.7).

2010 was declared as the 'International Year of Biodiversity' by the United Nations (UN 2010). In celebrating the theme, there was huge support and the pledge to achieve the aim in the Nagoya Declaration that was outlined at the 2nd International Conference of the Network Urban Biodiversity and Design (URBIO) 2010). URBIO (2011) outlined that the two main aims concluded during the conference were;

1) The urban ecological network has to be maintained, restored and developed with respect to patches, corridors and the urban matrix. Ecological networks should be well designed to adapt to climate change and to conserve local biodiversity in fragmented urban ecosystems. Remnant patches, such as

shrine forests and cemeteries, exist in many cities and are important biodiversity resources.

2) Management practices, restoration and ecological design must drive conservation and counter threats to native biodiversity. For example, Satoyama provides an insight into a way of living in harmony with nature and into the management of biodiversity in cities.

Importance of urban wildlife in cities

The United Nations declared 2010 as the 'International Year of Biodiversity'. The biodiversity movement initiated many activities such as conferences and debates on world biodiversity (UN 2010). This movement has sought and promoted fresh commitments since the United Nations Conference on Environment and Development in Rio de Janeiro in 1992. Malaysia has been strengthening conservation policies through the Convention on Biological Diversity 1994 with the vision of operating national policy over conservation programs (Ministry of Science 1998).

With the focus on mega fauna, there are less concern and less effective management in relation to less popular wildlife species especially those in urban areas. There are few research on the impact and relationship of urbanisation on urban wildlife. Thus, it is important to understand the human ecosystem in relation to urban vegetation and urban wildlife. Adam had this view on urban wildlife, "in a broad sense includes non-domestic vertebrates and invertebrates of urban and urbanizing areas. This includes wildlife, and plant associates, of the built-up downtown, suburbia, and urban-rural fringe of cities, town and village" (Adam 2005, p. 139).

Urban wildlife has adapted to new environments through the urbanisation process. Despite decreasing species' richness, urban wildlife has somehow increased and has become homogeneous in species-dominated urban spaces (Savard, Clergeau & Mennechez 2000; Chace & Walsh 2006; McKinney 2008; Loss, Ruiz & Brawn 2009).

Species' richness and density can be associated with the quality of urban environment. Thus, many researchers have studied birds as a biological indicator. Most of the studies concluded that as we move from CBD to sub urban areas, agriculture land, rural and natural land areas the percentage of species richness increased (DeGraaf, Geis & Healy 1991; Zalewski 1994; Savard et al.2000; Chace & Walsh 2006).

Urban design and planning of the urban areas face greater challenges and play an important role in the protection and

conservation of urban biodiversity. The awareness of conservation is important to fulfill physical and social needs as cities grow rapidly.

METHODOLOGY

The study has been designed to take a triangulation approach which is the combination of qualitative and quantitative research approaches. The study has been divided into a three steps of data collections which are:

- Step 1: Interviews with stakeholder and local authorities
- Step 2: Landscape observation, inventory of wildlife and vegetation
- Step 3: Questionnaire survey of stakeholders and residents in Kuala Lumpur on the effect of the 'human dimension' on urban wildlife.

Step 1, the interviews were conducted to investigate opinions about urban green space from the perspective of stakeholders. The aim was to capture legislative and management issues regarding urban green space and biodiversity conservation and management in Kuala Lumpur. The stakeholders involved in the interviews were the Kuala Lumpur City Council (CHKL), the National Landscape Department (NLD) from the Ministry of Local Housing, Local Authorities of Malaysia and the Department of Wildlife and National Parks (DWNP) Wilayah Persekutuan Kuala Lumpur branch, under the Ministry of Natural Resources and Environment (NRE). The stakeholders agreed to take part in interviews and to provide other material as secondary data such as annual reports and maps. The stakeholders were contacted to arrange appointments before the interviews were conducted. The interviews were conducted face-to-face with the officers and the questionnaire was prepared to guide the researcher through the semi-structured interviews.

Step 2, the geographic characteristics, density of species and legibility of the sites influenced which approaches were suitable for use in the survey. Thus, the studies on wildlife and the vegetation observation survey have applied the 'distance sampling method' approach. This approach was introduced by Buckland (1993). 'Distance sampling' has been used widely in identifying wildlife and vegetation. In the wildlife survey, the researcher used the simple count approach in the transect line method. The transect lines consisted of 1-4 lines depending on the size of the urban parks. The transect line covered the habitat found in the urban parks. Each transect line was recorded twice a day, in the early morning

between 7.30am to 10.00am and in the evening from 4.00pm until 6.00pm. Observation was used to identify the species within 30 meters distance perpendicular to the transect line. Identified species were validated using the species database provided by the Department of Wildlife and National Parks (DWNP).

Step 3, the questionnaire survey targeted two major groups namely stakeholders and residents. A total of 416 respondents comprising of 128 stakeholders (30.8%) and 288 residents (69.2%) were surveyed (refer to Table 1.1).

Table 1.1 number of stakeholders and residents surveyed

	Frequency	(%)
Stakeholders	128	30.8
Residents	288	69.2
Total	416	100

Stakeholders

Firstly, a questionnaire survey of stakeholders was conducted. The professional group consists of planners, architects and landscape architect firms. Table 1.2 depicts the composition of stakeholder respondents. Of the total respondents, 128 (30.8%) were stakeholders from: CHKL n=13 (3.1%), NLD n=11 (2.6%), Architects n=34 (8.2%), Planners n=35 (8.4%) and Landscape Architects n=35 (8.4%).

Table 1.2 Stakeholders surveyed from different agencies

Stakeholders	Number	(%)
CHKL	13	3.1
NLD	11	2.6
Architects	34	8.2
Planners	35	8.4
Landscape Architects	35	8.4
Total	128	30.8

Residents

Residents from five districts in Kuala Lumpur participated in the study. Nine residential areas from the five districts were selected. These residential areas were located within a distance of two kilometres from the nearest local urban parks. The questionnaire was distributed to residents on the weekend; because it was easy to approach residents at this time and usually all family members were available. Sample households were selected through systematic random sampling. The respondents were firstly introduced by the researcher about the nature of the research and were asked to participate. The questionnaires were collected the following day. A total of 288 households from nine residential areas participated in the survey. The number of respondents and valid number of surveys are presented in Table 1.3.

Table 1.3 Percentage between residents

Urban parks	Frequency	(%)
Metropolitan Kepong park	31	7.5
Batu Metropolitan park	30	7.2
Titiwangsa Lake Garden	31	7.5
Datuk Keramat park	29	7.0
Pudu Ulu park	32	7.7
Permaisuri Lake Garden	27	6.5
Bukit Jalil park	38	9.1
Manjalara park	40	9.6
Perdana Lake Garden	30	7.2
Total	288	69.2

RESULTS

Stakeholders perception on wildlife

Urban biodiversity has many challenges to confront in the urban environment. Stakeholders have highlighted the challenges relating to the planning stage. The government needs to acknowledge the importance of urban biodiversity and translate it in the first stage of planning development because only then will other instruments such as management, budget and implementation take place. However,

most of them agreed that there is a missing factor in the planning stage and this may be related to awareness among the planners, decision makers, politicians and others. One respondent stated that "...Generally in Malaysia biodiversity adaptation for urban planning has less consideration" (respondent no. 3 CHKL)

"The idea to have a biodiversity approach has been stated in early stages of planning; however, it was not emphasised as an important approach or concept. Moreover, the concept maybe is not accepted by higher levels of administration and management..." (respondent no. 2 NLD). A second respondent also agreed that the planning stage is the important platform that could influence others in urban wildlife conservation. He believed that ".... Because there are not many lands that can be categorised as green space which have density of wildlife. Thus there are no concerns with having urban wildlife management either in City Hall of Kuala Lumpur or the National Landscape Department. So here I'm looking at actually starting from the planning stage and then the management stage could develop possibilities for planning for and management of urban wildlife".

Introducing wildlife that is more tolerant than native species could dominate urban green space. Thus, it may be a threat to small and sensitive wildlife species. Feeding the animals is not a healthy habit and it could cause problems such as over-population, food chain imbalance and conflict with humans. This has been addressed in statements like"... of course we have concerns about urban wildlife and habitat. However, wildlife which makes less mess and conflict may be suitable. For example we have problems with crows because there are too many and it makes the place untidy. Monkeys are increasing in number partly due to feeding habits of the tourists and locals. For me I would also like to hear the public's opinion on urban wildlife issues....." (respondent no. 1 DWNP). The study identified some key issues related to urban green space development from the interviews with stakeholders which are summarized in Table 1.4.

Table 1.4 Key finding on urban green space and wildlife addressed by stakeholders

Factors	Key findings
Sustainable City	▪ Integrated and multidisciplinary approach in planning the cities – participation by local authorities, developers, agencies and citizens. ▪ Sustainable practice is applied in urban developments which are concern on economic, social and environmental

	justice.
Urban green space	▪ Open space and green space definition used in planning is a broad definition and very between government agencies. ▪ Land status: the need to gazette the land used. ▪ Maintenance and management of green space: a significant amount of money to spend. ▪ Converting the green space to development: development pressure, weak enforcement, existing Act needs to be strengthened ▪ Approach to planning for the green space: apply in planning stages, developments and maintenance. and ▪ Public awareness: pressure groups, NGOs participation in urban developments.
Urban biodiversity	▪ Awareness on biodiversity conservation among the planners, decision makers at higher levels of administrative and politician. ▪ Biodiversity issues are included beginning of planning stages. ▪ Apply the biodiversity management to improve the density and variety of wildlife and native plant species.

Wildlife observation

Second step, the wildlife observation investigated the abundance of species in nine urban parks in Kuala Lumpur. Most of the urban parks were historically former mining areas and have been upgraded as public spaces. Most of the urban parks have large water bodies and are dominated by a mixture of vegetation such as palms and large trees, for example, *Casuarina equisetifolia* (she-oak), *Ficus benjamina* (weeping fig) and *Khaya grandiflora* (African mahogany).

In summary, the results indicated that there were 24 species of birds, five species of reptiles and two species of small mammals found in Kuala Lumpur's urban parks. Five urban parks had more than 10% of the types of urban wildlife species. Figures 1.1 and 1.2 shows that, Perdana Lake Garden had the highest percentage with 17%. The second highest was Batu Metropolitan Park (14%), followed by Titiwangsa Lake Garden and Kepong Metropolitan Park (14%) and Bukit Jalil Park (11%). The most dominant bird species was *Passer montanus* (Eurasian tree sparrow/Ciak rumah), n=528 (33.4%). The

second-most frequently found bird species was *Acridotheres tritis* (common myna/Tiung gembala kerbau), n=360 (22.7%) followed by *Corvus macrorhynchos* (crow/Gagak paruh besar), n=177 (11.2%) (refer to table 7.13 and figure 7.12). Most of these bird species originated from countries such as Indonesia and Australia, were frequently found in the open areas. The *Corvus macrorhynchos* (crow/Gagak paruh besar) were frequently found in untidy places with less vegetation dominated by hard surfaces.

Hirundo rustica (barn swallow/Sualo api), *Hirundo daurica* (red-rumped swallow) and *Aplonis panayensis* (Asian glossy starling/Perling mata merah) were also usually found in Kuala Lumpur's urban parks. These species of birds were also usually found in open areas and are not native species. Thus, this indicated that the dominant bird species in Kuala Lumpur's urban parks were common birds which were non-native species.

Native and protected species such as *Copsychus saularis* (magpie robin/Murai kampong), *Bulbucus ibis* (cattle egret/Bangau putih), *Oriolus chinensis* (black-naped oriole/Dendang selayang), *Streptopelia chinensis* (spotted-necked dove/Merbok balam), *Alcedo atthis* (common kingfisher/Pekaka cit cit) and *Aethopyga siparaja* (crimson sunbird/Kelicap sepah raja) were found less frequently during the survey.

Not many reptile species were found during the survey. Only five reptile species were found, namely: *Varanus salvator* (water lizard/biawak), *Trachemy scripta elegans* (red-eared slider (terrapin)/Kura-kura telinga merah), *Hemidactylus frenatus* (Pacific gecko), *Pytas Mucosus* (Oriental rat snake) and *Bronchocela cristatella* (green-crested lizard/Sesumpah). Furthermore, only two species of small mammals, *Scotophilus kuhlii* (lesser Asiatic yellow house bat/Kelawar rumah) and *Tupaia glis* (common tree shrew (squirrel)), were found during the observation survey. This indicated that there was low ecological food chain as small mammals were almost extinct from urban parks.

Figure 1.1 Total wildlife species found in urban parks

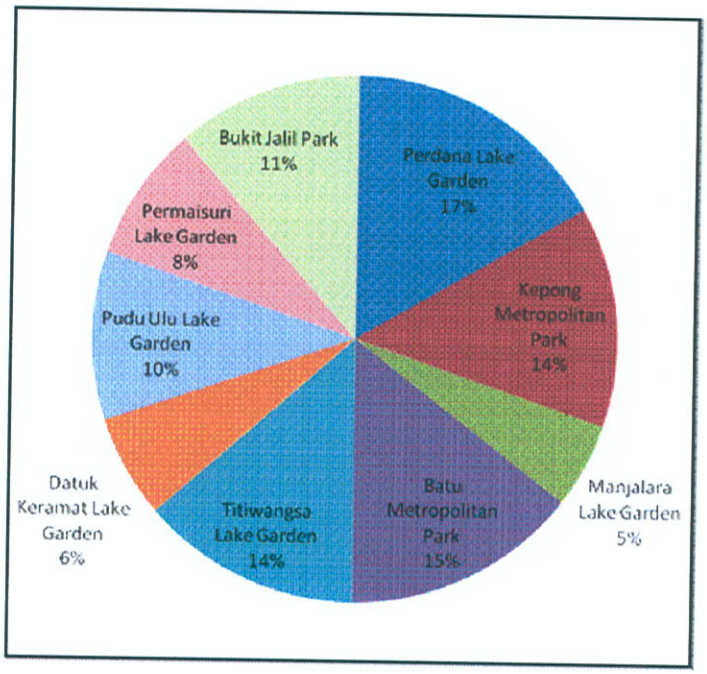
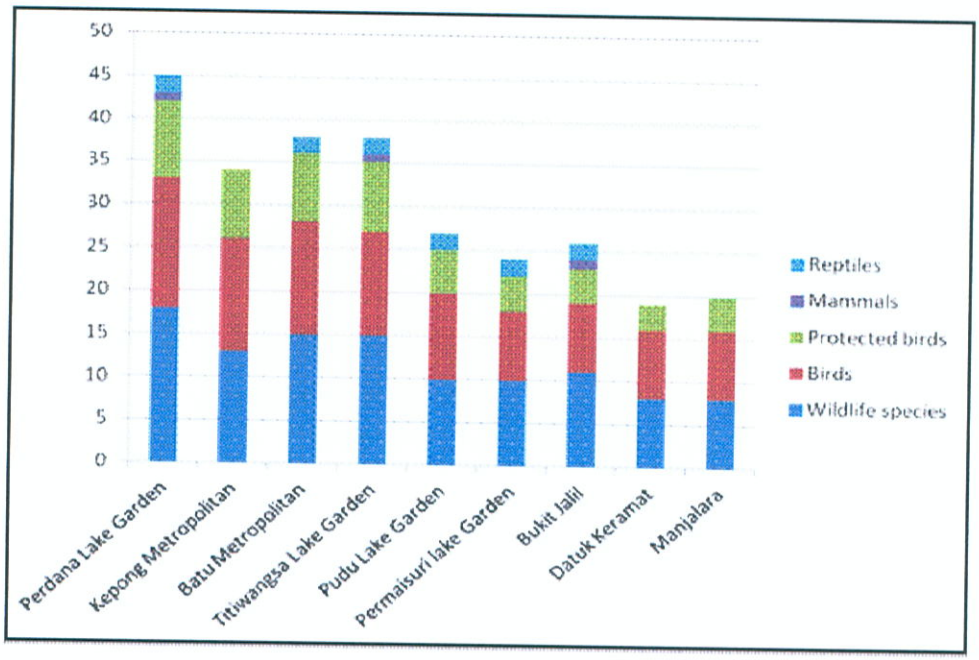


Figure 1.2 Categories of wildlife found in urban parks



Values of stakeholders and residents

The descriptive analysis of values indicated that moralistic, ecologistic and moralistic values were the three dominant types of values held by people in Kuala Lumpur.

The study then investigated the differences between the two groups namely stakeholders and residents. The Anova was used to identify weather the values were similar or they had significant differences. The F statistic, or F value, is a random variable that has an F distribution and P value is the estimated probability of rejecting the null hypothesis (no differences); if the confidence level is $p<0.05$ the results showed significant differences between the variables.

The results in table 1.5 showed that among the nine values, two values had significant differences. These were the moralistic value $F = 10.406$, $p<0.001$ and aesthetic value $F = 5.388$, $p<0.05$. Stakeholders had a higher score on the moralistic value, whereas residents scored more on the aesthetic value. Thus, the public had more concern about the aesthetic value and this could be an important value in attracting public participation and interaction with urban biodiversity activities.

Table 1.5 Values on urban wildlife expressed by stakeholders and residents

Values		Mean	Std. Deviation	F	Sig.
Naturalistic	Stakeholders	3.6080	.64905	1.818	0.178
	Residents	3.7005	.63027		
Ecologistic	Stakeholders	3.8293	.56577	0.422	0.516
	Residents	3.7862	.63675		
Humanistic	Stakeholders	2.7920	.83994	0.897	0.344
	Residents	2.8720	.75620		
Moralistic	Stakeholders	4.3493	.57868	10.406	0.001***
	Residents	4.1244	.67527		
Scientific	Stakeholders	3.5093	.78810	0.038	0.845
	Resident	3.4940	.69947		
Aesthetic	Stakeholders	1.6293	.54578	5.388	0.021*
	Residents	1.7826	.64027		

Utilitarian	Stakeholders	2.9280	.85151	0.588	0.444
	Residents	2.8527	.93681		
Dominionistic	Stakeholders	2.8800	.85236	1.338	0.248
	Resident	2.7790	.79026		
Negativistic	Stakeholders	3.1387	1.19676	0.92	0.338
	Residents	3.0386	.84382		

*p<0.05, **p<0.01, ***p<0.001

Knowledge on wildlife

The data which are presented in this section are based upon participants' responses to 12 wildlife photos. Firstly, the 12 photos of urban wildlife were selected from the previous landscape observation survey on urban wildlife in Kuala Lumpur's urban parks The photos were displayed in the questionnaire and respondents had to identify either the scientific or common name in English or the Malay language. The scores were 3 (correct answer), 2 (wrong answer), 1 (don't know) and 0 (no answer/missing).

The reliability analyses score from Cronbach's alpha was 0.794, that is, all wildlife photos presented in the questionnaire were reliable. Each of the photos achieved a score with a reliability coefficient from Cronbach's alpha of 0.7-0.8. The species of urban wildlife illustrated in the questionnaire are listed in Table 1.6.

Table 1.6 List of urban wildlife displayed in the questionnaire

No	Scientific name	Common name	Remarks
1	*Passer montanus*	Sparrow – Ciak rumah	Common bird
2	*Acridotheres tritis*	Myna – Tiung gembala kerbau	Common bird
3	*Copsychus saularis*	Robin – Murai	Protected bird
4	*Oriolus chinensis*	Black-naped oriole	Protected bird
5	*Pycnonotus goiavier*	(Yellow-vented bulbul)/Merbah	Protected bird
6	*Ardea cinerea*	Little heron – Puchong	Protected bird
7	*Alcedo atthis*	Kingfisher– Rajawali/ pekaka cit cit	Protected bird

8	*Aethopyga siparaja*	Sunbird	Protected bird
9	*Trachemyscripta elegans*	Terrapin (red-eared slider) – Kura-kura telinga merah	Common reptile
10	*Bronchocela cristatella*	(Green-crested lizard) –Sesumpah	Protected reptile
11	*Varanus salvator*	Water lizard – Biawak air	Common reptile
12	*Tupaia glis*	Squirrel (common tree shrew) – Tupai	Common small mammal

The study investigated respondents' knowledge about wildlife identification. A total of 395 respondents identified the wildlife photos after the data had been cleaned of those with missing values. Firstly, respondents were asked to identify common birds. Two photos of common birds were presented for identification. The first photo (bird no 1) was of *Passer montanus*/sparrow and the second (bird no 2) was of *Acridotheres tritis*/myna. The results found that an average number of respondents could recognise both species. For bird no 1, results indicated that 44.3% of respondents could recognise the species, 4.8% had the wrong answer and 50.9% did not recognise the sparrow. For bird no 2, the myna, results showed that 41% of respondents recognised the species, 9.9% had the wrong answer and 49.1% did not recognise the bird.

The results indicated that knowledge of common birds found in Kuala Lumpur's urban parks was at average levels. According to the observation survey in the previous study, these two species are frequently found in large numbers in urban parks. However, people in Kuala Lumpur were found to be less aware of the species' names.

Secondly, respondents were asked to identify protected bird species found in Kuala Lumpur's urban parks. There were photos of six species of birds to be identified as follows: (bird no 3) – *Copsychus saularis*/magpie robin/murai; (bird no 4) – *Oriolus chinensis*/black-naped oriole; (bird no 5) – *Pycnonotus goiavier*/merbah; (bird no 6) – *Ardea cinerea*/little heron/Puchong; (bird no 7) – *Alcedo atthis*/ kingfisher/ Rajawali/ pekaka cit cit; and (bird no 8) – *Aethopyga siparaja*/sunbird.

The results indicated that, of the six protected species, respondents were only able to identify one species with the right answer which was (bird no 7) – *Alcedo atthis*/ kingfisher/pekaka cit-cit. In all, 51% of respondents could identify this species, 6% had the wrong answer and 43% could not recognise the kingfisher. The other five species

scored a very low percentage for the right answer which was less than 20% and most (75%-90%) could not recognise these bird species .This showed that the people of Kuala Lumpur had lower knowledge of protected or native bird species. The kingfisher/Rajawali/pekaka cit cit was the only species that most people could recognise perhaps because the species was exposed in the media and story books. This species was usually easy to find in Kuala Lumpur's urban parks because most of the parks had water bodies such as lakes

Engagement behaviour with wildlife

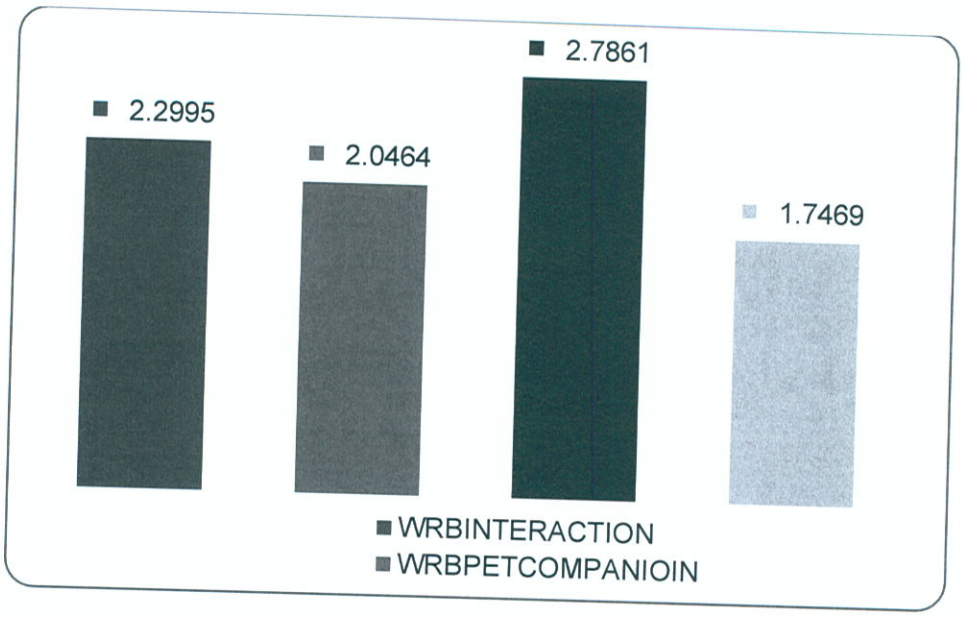
In general, the study investigated the mean score for the behavioural variables: interaction with wildlife in parks, companion with pets, interaction with new media and conservation participation. The descriptive statistics indicated that the highest mean score for behaviour towards animals in public parks was the interaction with new media in relation to wildlife such as watching television, reading books and purchasing wildlife-related art with a mean score of 2.7861. The second highest, with a mean score of 2.2995, was interaction directly with wildlife in the public parks such as feeding animals, fishing and taking photos and this was then followed by people who were companions with pets. The lowest mean score at 1.7469 was people who participated in conservation for animal activities (refer table 1.7).

The results indicated that there was a lower mean score <3 in all behavioural variables towards animals in Kuala Lumpur among respondents. The respondents scored lower for behaviour in animal-related activities which means that they had lower involvement in activities with wildlife in which there was either direct or indirect interaction (refer figure 1.3).

Table 1.7 Descriptive statistics of wildlife-related behaviour

Behaviour	N	Minimum	Maximum	Mean	Std. Deviation
Interaction	399	1.00	5.00	2.2995	.78140
Pet companion	399	1.00	5.00	2.0464	1.02039
Media	399	1.00	5.00	2.7861	.87934
Conservation	399	1.00	5.00	1.7469	.99488

Figure 1.3 Wildlife-related behaviour



DISCUSSION

The concept of sustainable development has been recognised worldwide as an approach in city planning (Potschin & Young 2006; Antrop 2006; Blaschke 2006); however, the environmental benefits have been less appreciated by some stakeholders and the community (Loures et al. 2007; Clifton 2011). Similar results have been shown in this research; urban park visitors expressed less understanding about the 'sustainable city' concept and most of them believed that massive physical development represented progress and sustainability. For example, the study by Clifton (2011) agreed that most South Australian citizens practiced a lifestyle which had a high ecological footprint and was unsustainable. Thus, awareness of the public has a significant impact on achieving sustainability. Clifton also found that sustainability concepts outlined by the South Australian Government in city planning and development addressed more reformist approaches. Nevertheless, he believed that transformational approaches should be given more priority in achieving world concept sustainability. This study found that people had a lack of awareness about biodiversity and that adequate information to address biodiversity issues was not provided in planning documents. The City Hall of Kuala Lumpur (CHKL) could practice both the reformist and transformational approaches in planning and management by strengthening the existing structure plan, guidelines and policies.

Transformational approaches in Kuala Lumpur's green strategies can be identified such as the development of new parks and planning for green corridors. CHKL aims to achieve 10% of green space development by 2020. However, low levels of participation in the government campaign by private agencies, NGOs, the public and developers have had a significant impact on progress.

The government should have comprehensible policies and guidelines to increase non-government agencies' participation and especially participation by developers in providing comprehensive sustainability design in their developments and their support for the government's aim of being a 'Sustainable Tropical Garden City' by 2020 (BH 2008). In fact, a reduction in contribution by developers and in comprehensive guidelines and policies causes a lower number and reduced quality of urban green spaces especially of neighbourhood parks and local parks whereas these areas are important elements in achieving sustainable urban development (Nour 2011). Thus, the CHKL should give priority to the development of neighbourhood parks and local parks in terms of providing the quality of spaces so that citizens can have pleasant, convenient and safe environments, for example, by the enhancement of the parks' amenities and ecological environments.

The provision of 9% for neighbourhood parks and 4% for local parks by 2020 could be increased if the government could encourage developers to rely on the government's policies (CHKL 2004). However, there are policies for the 'Sustainable Tropical Garden City' which state that: "EN 1: 'CHKL shall promote beautification programs in residential, commercial and industrial areas" (CHKL 2003). This policy could outline some guidelines, for example, beautification could involve participation and contribution from developers and the community.

Landscape planning guidelines by the National Landscape Department have outlined that all categories of parks should achieve 60% of the area for softscape and 40% hardscape; however, in the CBD area, there is flexibility and it can have a minimum of 40% for softscape (NLD 2011). Salleh (2008) stated that most residents in low-cost housing developments expressed dissatisfaction in relation to their surrounding environment and local facilities such as recreation and play areas, social space and safety. Indirectly, this will lead to less participation and interaction with green spaces which could contribute to an impact on the social health of residents. Fortunately, Dali (2004) stated that, even though the local green space is of low quality in terms of facilities' provision, people in low-income residential areas perceived the benefits of green spaces as

outdoor recreational activity areas to be highly important. Neuvonen et al. (2007) agreed that sufficient provision of quality of space and legibility of urban green space would attract more people to participate in natural environmental activities.

At this point, green strategies are attracting less attention from many cities including Kuala Lumpur. This creates difficulties in managing and monitoring the development of green strategies. James et al. (2009) addressed two issues: treating urban green spaces with less understanding and knowledge about multiple benefits, and the value of green space which does not synchronise with decision making.

Thus, the campaign and research crucially need to promote sustainability, especially for urban vegetation and wildlife conservation, among academics, professionals and decision makers. However, there are already policies for flora and fauna which state that; "EN 13: CHKL shall conserve residual forest areas and maintain a sustainable variety and population of wildlife within the City boundaries" (CHKL 2003). This policy seeks to establish programs to give attention to biodiversity conservation and it should involve researchers, NGOs and communities.

CONCLUSION

Initiative, awareness and commitment from the local government to initiate and conserve biodiversity in urban areas are essential: these commitments have been voiced in the URBIO 2010 conference in Nagoya, Japan. The convention promoted the role of local authorities in providing the biodiversity plan and including its regulation in future planning (Muller & Werner 2010). Thus, Kuala Lumpur should show its commitment to ensuring that the healthy development of urban flora and fauna could be maintained and could be natural resources for the city. Muller & Werner (2010) also agreed that conservation of urban biodiversity will give greater impact to protection from biodiversity loss around the globe. The research suggested little improvements that could enhance the study of urban public parks and environmental attitudes.

Malaysian wildlife management must include biodiversity strategies, planning and management in cities. The local governments and authorities play an important role in ensuring that these strategies are applied in planning and physical developments on all scales and especially those involving urban developments. They must move towards environmental and sustainable approaches which promote

the balance between social and economic factors, and the environment. The environmental attitude research could be extended to involve the community and it is well known as 'community sciences'. Recently, this approach has been used to attract people to participate and, at the same time, to involve stakeholders in playing a role as the main sponsors of activities. During the wildlife observation survey, the community asked for examples of what they could be involved in, such as bird watching. This approach has huge potential and provides benefits to enhance knowledge among urban citizens. Indirectly or directly, it will involve conservation activities among society members .Through this approach, the environmental attitude will have the opportunity to become more objective with the direct input of people's values, attitude, knowledge and behavior. This approach may also involve a wide range of society levels such as schoolchildren, adults and older people.

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