

Environmental Attitude: Values on Urban Wildlife

A Case Study of Kuala Lumpur Urban Parks

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ABSTRACT

'Urban biodiversity and wildlife management' has been accepted as being an important urban ecological component in an urban environment. The improvement of urban plans and landscape fabric can potentially advance the urban ecological environment. Thus, many local authorities aim to outline green strategies in their local plans to improve the city's health. However, the study of urban biodiversity and its relation to the human dimension is not well explored by researchers. Miller (2003) and Jones et al. (1998) argue that there is a lack of empirical research leading to inconclusive knowledge in this field. 'Human dimension' is the study of integration between the social dimension and existing ecological information. This paper aims to investigate environmental attitudes on urban biodiversity especially on urban wildlife in Kuala Lumpur. It assesses the potential of 'human dimension' in realising planning objectives in Kuala Lumpur. The research will investigate the links and relationships between demographic factors and values with regard to urban biodiversity. Information collected through a questionnaire survey is the informational basis of this study. The survey focused on two major groups, namely stakeholders (n = 128) and residents (n = 288). The results indicated that people who lived close to Kuala Lumpur urban parks had higher moralistic values towards urban wildlife. Naturalistic, ecologicistic and scientific values had mean scores between 3.5 and 4.0, which could be considered as an acceptable degree of agreement. Most respondents placed higher values on wildlife and its ecosystems. Other values such as negativistic, humanistic, utilitarian and dominionistic values had mean scores between 2.5 and 3.00 indicating that these values depend on specific issues and situations related to urban wildlife. It could be inferred that people in Kuala Lumpur do not have strong negativistic, humanistic, utilitarian and dominionistic values towards urban wildlife. This research will help in improving green urbanism strategies, to achieve sustainable living environments.

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INTRODUCTION

‘Urban biodiversity and wildlife management’ has been accepted as an important ecological component for the betterment of the urban environment. Improvements in urban plans and of the landscape fabric can potentially enrich the urban ecological environment (Miller 2003; Potschin & Young 2006). Thus, many local authorities have embedded ecological principles in city planning such as implementing green strategies in their local plans to improve the city’s health (Maruani 2007). Developed countries especially in Europe have improved their mechanisms for green space strategies, and for urban biodiversity and wildlife management (Swanwick et al. 2003). At the same time developing countries still struggle with high priority issues such as informal housing, urban poverty, clean water, sewerage, law enforcement and uniformity in policy implementation as they endeavor to devote attention towards open space planning (Maruani 2007).

There has been an increasing demand on preserving urban biodiversity around the world. This includes human and wildlife interrelationships in the urban environment. A ‘Human dimension’ encapsulates the integration between the social dimension and existing ecological information. Decker et al. (2001 cited in Miller 2003, p. 465) defined this as “how people value wildlife, how they want wildlife to be managed, and how they affect or are affected by wildlife and wildlife management decisions”.

Bjerke (1998, p. 79) supports this urban biodiversity concept and it’s relation to the human dimension. He stated that “wide consensus exists that human attitude and behavior toward nature must be understood and often influenced in order to avoid further loss of biodiversity”. However, studies about urban biodiversity and their relationship to the human dimension have been less of a focus for researchers in the past. Miller (2003) and Darren et al. (1998) agree that there is a lack of research and contribution of knowledge to this area. For example, in Australia, the related human dimension and need to enhance this relationship in order to promote sustainable wildlife management especially in the city is still lacking both in research and in the implementation through guidelines (Miller 2003).

Kurz and Baudains (2012) argued that protection of biodiversity through native habitat provision is becoming recognised as an important issue for protecting the biodiversity of urban areas. Kurz and Baudains (2012) stated that “the ecological importance of developing effective means by which to improve biodiversity in urban areas has been highlighted”. Hence, protection of biodiversity in urban areas involves a relationship between urban landscape protection, attitudes and behaviors, and their significance for urban biodiversity (Kurz & Baudains 2012).

In general, the focus on urban biodiversity such as urban wildlife has had less attention compared to mega fauna conservation especially in the hot spot biodiversity populations such as in Asia and Africa (Azhar et al. 2008). For example, in Malaysia, wildlife management in areas

such as conservation, research and wildlife conflict have developed excellent experience based outcomes (Manokaran 1992, Azhar et al. 2008). However, the scope is limited to forests and national parks. This means that the government does not provide sufficient mechanisms for handling and managing urban biodiversity (Baharuddin et al. 2009). Local authorities in Malaysia do not have adequate mechanisms to manage urban wildlife. Thus, there is neglect of urban biodiversity leading to habitat and biodiversity loss, especially pertaining to the protected wildlife species and native vegetation.

Salleh (2008) stated that most residents in low-cost housing developments expressed dissatisfaction in relation to their surrounding environments, especially the lack of local facilities such as recreation and play areas, social spaces and green spaces. Indirectly, this leads to less participation and interaction in green spaces, which contributes to an impact on the social health of residents. Fortunately, Dali's research (2004) states that even though the local green space is of low quality in terms of facilities, people in low-income residential areas perceived the benefits of green spaces, such as outdoor recreational activity areas to be highly important.

This paper aims to investigate environmental attitudes of people in Kuala Lumpur on urban biodiversity and urban wildlife. It aims to share the 'human dimension' attribute in promoting and supporting Kuala Lumpur's future plans. This research investigated and compared such values relating to urban parks and biodiversity by engaging stakeholders, such as local authorities, NGOs, built environment professionals, residents and users of urban parks in Kuala Lumpur.

AN ENVIRONMENTAL ATTITUDE

One's Environmental attitude concerns and relates to their access of living environment. People become more aware of this because environmental resources are gradually being depleted. People's perception is important in order to understand their needs related to their social behavior, culture and beliefs. This human dimension is important to be integrated with ecological dimension as it helps to manage and conserve better urban ecosystems and healthy environments (Claire 2002; Miller 2000; Stern et al. 1993 and Teel et al. 2007). The Living environment is fragile and some activities damage and create imbalance. This damage and rate of damage can be accelerated if the environment is not managed properly and wisely. Concern and growing awareness of the environment, and its problems consequently attracts researchers who want to understand and measure the relationships between supporting conservation and protection of the living environment in cities (Dunlap et al. 2000; Hunter & Rinner 2004).

There are many methods of measuring environmental concerns, such as the New Environmental Paradigm (NEP) developed by Dunlap and Van Liere in 1978. The NEP scale is among the popular measurements

used by researchers and widely recognized (Dunlap et al. 2000; Hunter & Rinner 2004; Bjerke et al. 2006). Kellert (1984) pioneered the method of evaluating peoples' attitudes towards wildlife and natural environment. He developed attitude typology related to perceived benefits of wildlife. Kellert's typology has been widely used by researchers to identify public concerns and indirectly helping policy makers and land managers to understand physical patterns of landscape fabric (Claire 2002; Rauwald & Moore 2002; Hunter & Rinner 2004).

Kellert's typology consists of nine basic attitudes or valuations toward animals: Naturalistic, Ecologistic, Humanistic, Moralistic, Scientistic, Aesthetic, Utilitarian, Dominionistic and Negativistic (Kellert 1984; Claire 2002; Rauwald 2002; Hunter & Rinner 2004). This value orientation is not only to measure the human dimension relation to wildlife but it also represents the value of the nature generally. According to Rauwald & Moore (2002, p. 712) "Kellert believed that his measures of attitudes, knowledge, and behaviors towards animals are a reflection of the relationship between human and nature".

Kellert (1984) found that humanistic perspective were the strongest in the United States. His findings suggest a strong emotional orientation towards wildlife and the natural environment. However, in more recent years, Claire (2002) found that ecological' attitudes towards wildlife are more significant to urban dwellers. There has been a substantial change in the attitudes of urban dwellers, and this may be because of better education and cultural influences. This finding can help policy makers such as planners and park managers to allocate limited conservation resources more effectively.

In this paper, the results of an attitude survey of Kuala Lumpur residents capturing the resident views of the environment and wild life are presented. The study has applied the Kellert typology because it is suited to measuring attitudes at local level and provides an alternative to NEP in evaluating specific issues and environmental concerns. Bjerke (1998) supports the use of Kellert Typology because the findings show that the typology has high degree of validity.

METHOD

This paper is a part of ongoing research on 'The Role of urban parks and attitude towards urban wildlife'. A qualitative approach including interviews with local authorities and visitors were undertaken followed by a landscape observation survey on urban biodiversity. The questionnaire survey targeted two major groups namely stakeholders and residents. A total of 416 respondents comprising of 128 (30.8%) stakeholders and residents n = 288 (69.2%) were surveyed (refer to Table 1).

	Number	Percent
Stakeholders	128	30.8
Residents	288	69.2
Total	416	100

Table 1: Number of stakeholders and residents surveyed

Firstly, a questionnaire survey of stakeholders was conducted. The survey began with local authorities such as the National Landscape Department (NLD) and Department of Landscape in the City Hall of Kuala Lumpur (CHKL). The researcher contacted the offices and distributed questionnaires to their staff. The questionnaire was collected a week later. Meanwhile, the professional groups which consisted of planning, architecture and landscape architecture firms were approached. As with the previous group, questionnaires were distributed and completed questionnaires were collected after one week. Table 2 depicts the composition of respondents.

Stakeholders	Number	Percent
City Hall of Kuala Lumpur	13	3.1
National Landscape Department	11	2.6
Architects	34	8.2
Planners	35	8.4
Landscape Architects	35	8.4
Total	128	30.8

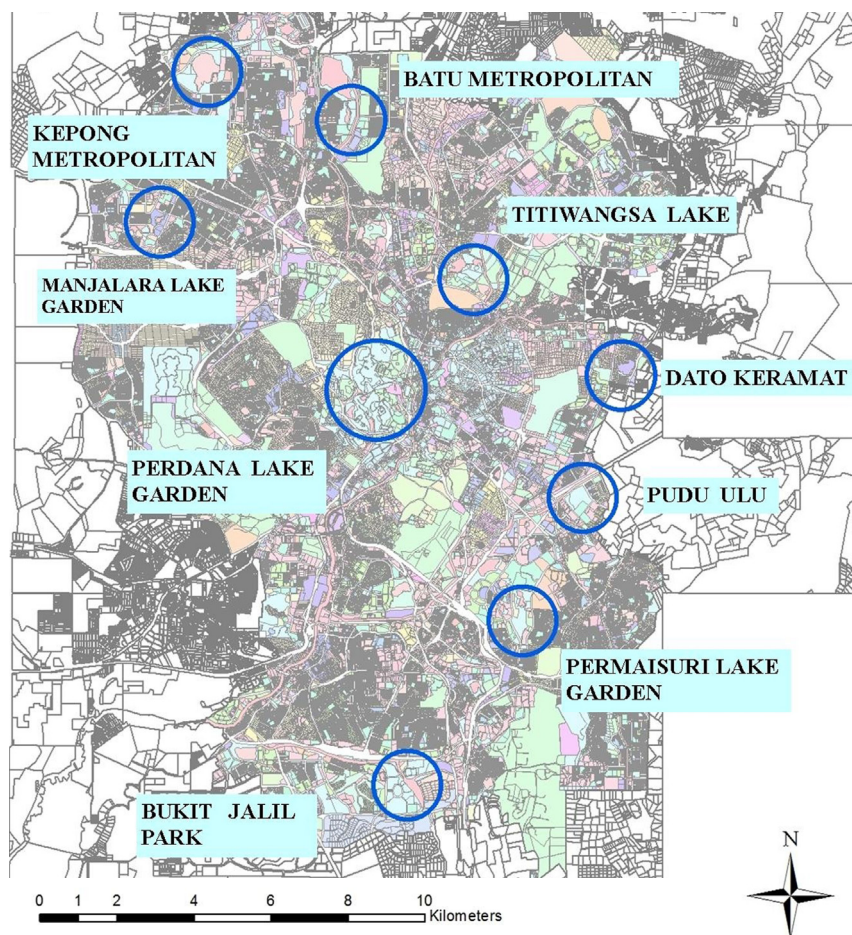
Table 2: Composition of survey respondents

Residents from five districts in Kuala Lumpur participated in the study. Nine residential areas from the five districts were selected. Figure 1 depicts the location of nine residential districts studied in the research. These residential areas were located within a distance of two to five kilometers from the nearest local urban park. The questionnaire was distributed to residents on the weekend; this was because it was easy to approach residents at this time and usually all family members were available. The households were selected through systematic random sampling. The respondents were firstly introduced by the researcher to the nature of the research and were asked to participate. The questionnaires were collected on 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 is presented in Table 3.

Table 3: Percentage of residents surveyed

Residential area	Number of households surveyed	Percent	Ecologicistic
Tmn Metropolitan Kepong	31	7.5	10.8
Tmn Kepong Batu Metropolitan	30	7.2	10.4
Tmn Tasik Titiwangsa	31	7.5	10.8
Tmn Datuk Keramat	29	7	10.1
Tmn Pudu Ulu	32	7.7	11.1
Tmn Tasik Permaisuri	27	6.5	9.4
Tmn Bukit Jalil	38	9.1	13.2
Tmn Tasik Manjalara	40	9.6	13.9
Tmn Tasik Perdana	30	69.2	100
Total	288	69.2	100

Figure 1: Location of sample urban parks in Kuala Lumpur.



QUESTIONNAIRE

The questionnaire survey was designed to investigate residents' and stakeholders' use of urban parks, to determine their preference regarding values, attitude, knowledge and behavior towards urban wildlife. The questionnaire was developed accordingly after referring to a previous interview survey and landscape observation survey on wildlife and vegetation in urban parks. The questionnaire includes general non-demographic questions such as how frequently people visited their closer urban parks and what were their motives, activities, main transportation and length of stay in the particular parks. In addition variables of the research such as demographic information which provided details on age, gender, level of education, ethnicity, occupation, income, etc were included.

Then, the questionnaire presented 27 statements about the animal and human relationships to assess how people valued wildlife. As depicted in Table 4, the statements were grouped into nine categories (three statements in each category) and were in accordance with Kellert's (1985) typology. The statements were adapted from Kellert's typology and some questions were modified based on experiences from previous interviews and observation surveys carried out in Kuala Lumpur. The values also had a score of 1 to 5 as per the Likert scale ranging from 'strongly disagree' to 'strongly agree' which were used as the basis for asking respondents to express their preferences on values towards wildlife.

Kellert Values/ Attitude towards animals	Definition
Naturalistic	Primary interest and affection for wildlife and the outdoors.
Ecologistic	Primary concern for the environment as a system, for interrelationships between wildlife species and natural habitats.
Humanistic	Primary interest and strong affection for individual animals, principally pets; regarding wildlife, primary focus on large animals with common anthropomorphic associations.
Moralistic	Primary concern for the right and wrong treatment of animals, with strong opposition to exploitation or cruelty toward animals.
Scientific	Primary interest in the physical attributes and biological functioning of animals.
Aesthetic	Primary interest in the artistic and symbolic characteristics of animals.

Table 4: The Kellert typology

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Kellert Values/ Attitude towards animals	Definition
Utilitarian	Primary concern for the practical and material value of animals or the animal's habitat.
Dominionistic	Primary interest in the mastery and control of animals, typically in sporting situations.
Negativistic	Primary orientation a dislike or fear of animals.

RESULTS

Values on Urban Wildlife

The aim of the research was to identify peoples' values towards urban biodiversity especially wildlife. It sought to develop strategies to improve the urban environment particularly urban parks because urban parks are not only to serve the community's activities and recreation but also to maintain the ecological functioning of the environment. The survey investigated 27 statements on 'values' about human relationship with wildlife. Based on Kellert's typology the statements were grouped into nine categories. Responses from respondents who had not completed any of the Kellert value statements were discarded. Thus, out of the total 416 respondents data from only 401 could be used as valid respondents. The study found that respondents in Kuala Lumpur had the highest score for the moralistic value towards urban wildlife. The moralistic value had the highest mean score of 4.1945. That is, most respondents agreed with moralistic values. According to Kellert, this means that people in Kuala Lumpur had primary concern for the right and wrong treatment of animals, with strong opposition to exploitation or cruelty towards animals.

Naturalistic, ecologicistic and scientific had mean value scores between 3.5 and 4, which could be considered as presenting a degree of agreement. That is, most respondents also expressed high value and interest related to wildlife and its ecosystems. The other values such as negativistic, humanistic, utilitarian and dominionistic had mean value scores between 2.5 to 3 (refer to Table 5). That also means that the people of Kuala Lumpur did not place a stronger value on negativistic, humanistic, utilitarian, or dominionistic values. Aesthetic value scored the lowest among respondents, indicating that this value did not really concern them.

Type Of Values	N	Minimum	Maximum	Mean	Standard Deviation
Naturalistic	401	1.00	5.00	3.6717	0.63681
Ecologistic	401	2.00	5.00	3.7997	0.61512
Humanistic	401	1.33	5.00	2.8470	0.78308
Moralistic	401	1.00	5.00	4.1945	0.65436
Scientific	401	1.00	5.00	3.4988	0.72729
Aesthetic	401	1.00	5.00	1.7348	0.61582
Utilitarian	401	1.00	5.00	2.8761	0.91068
Dominionistic	401	1.00	5.00	2.8105	0.81041
Negativistic	401	1.00	13.00	3.0698	0.96730

Table 5: Descriptive Statistics

Values on Urban Wildlife Expressed by Stakeholders and Residents

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

The study then investigated the values between the two groups, stakeholders and residents. This involved use of Anova to identify either that all values were similar or that 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 the significant differences between the variables.

The result in Table 6 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 6: Values on urban wildlife expressed by stakeholders and residents

Values		Mean	Std. Deviation	F	Significance level
Naturalistic	Stakeholder Resident	3.6080 3.7005	0.64905 0.63027	1.818	0.178
Ecologistic	Stakeholder Resident	3.8293 3.7862	0.56577 0.63675	0.422	0.516
Humanistic	Stakeholder Resident	2.7920 2.8720	0.83994 0.75620	0.897	0.344
Moralistic	Stakeholder Resident	4.3493 4.1244	0.57868 0.67527	10.406	0.001***
Scientific	Stakeholder Resident	3.5093 3.4940	0.78810 0.69947	0.038	0.845
Aesthetic	Stakeholder Resident	1.6293 1.7826	0.54578 0.64027	5.388	0.021*
Utilitarian	Stakeholder Resident	2.9280 2.8527	0.85151 0.93681	0.588	0.444
Dominionistic	Stakeholder Resident	2.8800 2.7790	0.85236 0.79026	1.338	0.444
Negativistic	401	3.1387 3.0386	1.19676 0.84382	0.92	0.338

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

Values Between Stakeholders

The differences and similarities between stakeholders were also investigated. The research indicates that among stakeholders, two values had significant differences. The values were scientific $F = 2.765$, $p < 0.05$ and dominionistic $F = 3.348$, $p < 0.01$. Survey responses by the National Landscape Department had a high level of agreement on scientific values followed by the City Hall of Kuala Lumpur (CHKL) and Architects. Both Landscape Architects and Planners scored the lowest. In the dominionistic value, the City Hall of Kuala Lumpur had the higher score. This meant that CHKL was in agreement about having control of animals while other stakeholders had a mean score below 3 with Planners the lowest. That is, most stakeholders were less in agreement about having control of animals (refer to Table 7).

Table 7: Values between stakeholders

Values		Mean	Std. Deviation	F	Significance level
Scientific	CHKL NLD Architect Planner Landscape Architect	3.7179 4.0000 3.6471 3.2647 3.3737	0.52434 0.71492 0.72447 0.97711 0.64419	2.765	0.031*
Dominionistic	CHKL NLD Architect Planner Landscape Architect	3.6667 2.8182 2.7745 2.7647 2.8182	0.56577 0.63675	3.348	0.012**

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

Values Between Residents

The study then investigated the values between residents. Nine housing areas located within two km radius from urban parks were investigated. The result led to the rejection of the null hypothesis that all residents living in different housing areas had the same values. As shown in Table 8 residents in different places were found to be significantly different in seven values: Naturalistic, $F = 2.076$, $p < 0.05$; Ecologicistic $F = 3.025$, $p < 0.01$; Moralistic $F = 2.164$, $p < 0.05$; Scientific $F = 2.338$, $p < 0.01$; Aesthetic $F = 1.986$, $p < 0.05$; Utilitarian $F = 2.508$, $p < 0.01$; and Dominionistic $F = 2.655$, $p < 0.01$.

Values		Mean	Std. Deviation	F	Significance level
Naturalistic	Metropolitan	3.6333	.65126	2.076	0.038*
	Kepong	3.6914	.61273		
	Kepong Batu				
	Metropolitan	3.5889	.74630		
	Tasik Titiwangsa	3.5556	.59197		
	Datuk Keramat	3.5208	.47093		
	Pudu Ulu	3.8333	.59815		
	Tasik Permaisuri	3.6961	.50830		
	Bukit Jalil	3.7333	.77423		
Ecologicistic	Manjalara	4.0556	.51850	3.025	0.003**
	Tasik Perdana				
	Metropolitan	3.6333	.68004		
	Kepong	3.7407	.73574		
	Kepong Batu				
	Metropolitan	3.9222	.77649		
	Tasik Titiwangsa	3.5926	.48334		
	Datuk Keramat	3.6875	.59831		
	Pudu Ulu	3.9487	.60877		
Moralistic	Tasik Permaisuri	3.6373	.47402	2.164	0.031*
	Bukit Jalil	3.7500	.61208		
	Manjalara	4.2000	.55086		
	Tasik Perdana				
	Metropolitan	3.9111	.74244		
	Kepong	4.1235	.64150		
	Kepong Batu				
	Metropolitan	4.2889	.53055		
	Tasik Titiwangsa	4.2099	.60020		
Scientific	Datuk Keramat	4.1250	.78403	2.338	0.019**
	Pudu Ulu	4.0641	.81660		
	Tasik Permaisuri	3.8922	.68027		
	Bukit Jalil	4.0917	.65367		
	Manjalara	4.4556	.45049		
	Tasik Perdana				
	Metropolitan	3.6889	.83475		
	Kepong	3.2840	.73207		
	Kepong Batu				
	Metropolitan	3.2889	.62351		
	Tasik Titiwangsa	3.4198	.70767		
	Datuk Keramat	3.4063	.60898		
	Pudu Ulu	3.7692	.60933		
	Tasik Permaisuri	3.3235	.57726		
	Bukit Jalil	3.7083	.64135		
	Manjalara	3.5222	.81970		
	Tasik Perdana				

Table 8: Values between residents from different areas

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

Table 8: Values between residents from different areas

Values		Mean	Std. Deviation	F	Significance level
Aesthetic	Metropolitan	1.8889	.71831	1.986	0.048*
	Kepong				
	Kepong Batu	1.9012	.67187		
	Metropolitan				
	Tasik Titiwangsa	1.6444	.47086		
	Datuk Keramat	1.7901	.51597		
	Pudu Ulu	1.6667	.63922		
	Tasik Permaisuri	1.6282	.82369		
	Bukit Jalil	2.0784	.47182		
Utilitarian	Manjalara	1.8000	.73108	2.508	0.012**
	Tasik Perdana	1.6000	.54245		
	Metropolitan				
	Kepong	2.6778	.72441		
	Kepong Batu	2.8519	1.07152		
	Metropolitan				
	Tasik Titiwangsa	3.4111	.98527		
	Datuk Keramat	2.8148	.78628		
	Pudu Ulu	3.0833	.96163		
Dominionistic	Tasik Permaisuri	2.4615	1.00256	2.655	0.008**
	Bukit Jalil	2.8529	.75296		
	Manjalara	2.7250	.80556		
	Tasik Perdana	2.7667	1.13512		
	Metropolitan				
	Kepong	2.6111	.84001		
	Kepong Batu	2.5556	.56990		
	Metropolitan				
	Tasik Titiwangsa	2.8556	.87836		
	Datuk Keramat	2.8889	.69183		
	Pudu Ulu	3.1146	.82787		
	Tasik Permaisuri	2.3333	.64636		
	Bukit Jalil	2.7941	.71074		
	Manjalara	2.7833	.71032		
	Tasik Perdana	2.9778	.97058		
	Metropolitan				
	Kepong				
	Kepong Batu				

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

Residents who lived closer to Taman Tasik Perdana had the highest mean score for three values: naturalistic, ecologicistic and moralistic. Meanwhile, residents who lived closer to Taman Datuk Keramat had the lowest mean score for naturalistic and ecologicistic values. In terms of the moralistic value, residents who lived closer to Taman Bukit Jalil had the lowest score. This therefore indicated that Taman Tasik Perdana may have had influence on residents' values because the park itself is one of the older parks in Malaysia and has strong ecological characteristics. On the other hand, Taman Datuk Keramat and Taman Bukit Jalil are new and contemporary urban parks with many physical elements and less ecological characteristics.

In terms of the scientific value, residents living closer to Taman Tasik Permaisuri and Taman Manjalara had the higher mean score. Meanwhile, residents living in the areas closer to Kepong Batu Metropolitan and Taman Tasik Titiwangsa had the lowest scores. The aesthetic value scored higher for residents in the area closer to Taman Bukit Jalil and residents closer to Perdana Lake Garden had the lowest mean score.

Furthermore, in terms of the utilitarian value, the result indicated that residents who lived in the area closer to Taman Tasik Titiwangsa and Taman Pudu Ulu had higher scores. Residents from other areas scored lower for the utilitarian value and residents living in the area closer to Taman Tasik Permaisuri had the lowest score for the utilitarian value. Thus, this indicated that most residents had lower utilitarian value towards urban wildlife. Finally, the dominionistic value received a higher score from residents living closer to Taman Pudu Ulu and residents around Taman Tasik Permaisuri were less dominionistic.

Values and Demographic Characteristics

The results present the values on urban biodiversity as expressed by stakeholders and residents of Kuala Lumpur. The association between Kellert's values and demographic information about the respondents such as gender, age and level of education were also investigated.

Effect of Age on Values

The values had a significant relationship to age of respondents. Both ecologicistic and moralistic values had a score $p < 0.01$ i.e. in terms of the ecologicistic value showed significant difference for different ages, $F = 3.126$, $p < 0.01$. Figure 2 showed there was lower engagement with the ecologicistic value by people aged less than 20. The score for the value increased as people grew older from the ages of 21 until 50 years. However, appreciation of the ecologicistic value decreased after age 50. Interestingly, after retirement age, the ecologicistic value had a higher score (refer to Table 9).

The moralistic value was found similar, significant to those of the ecologicistic value, $F = 3.962$, $p < 0.01$. Figure 3 showed that, people below 20 years old perceived a lower moralistic value but this score increased as people grew older. However, the group aged between age 40 and 50 had decreased scores for the moralistic value. Moralistic means 'primary concern for the right and wrong treatment of animals, with strong opposition to exploitation or cruelty toward animals'. Thus, this age group had lower concern for how animals were treated.

Values	Age	Mean	Std. Deviation	F	Significance level
Ecologicistic	<20	3.5170	.49094	3.126	0.009**
	21-30	3.8089	.62790		
	31-40	3.8702	.57809		
	41-50	3.8806	.66844		
	51-60	3.5952	.57257		
	>60	4.0000	.66667		

Table 9: Values and age of respondents

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

Table 9: Values and age of respondents

Values	Age	Mean	Std. Deviation	F	Significance level
Moralistic	<20	3.8844	.62565	3.962	0.002**
	21-30	4.1844	.66391		
	31-40	4.3540	.59974		
	41-50	4.1642	.69479		
	51-60	4.3333	.43363		
	>60	4.4000	.68313		

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

Figure 2: Ecologistic value and age of respondents

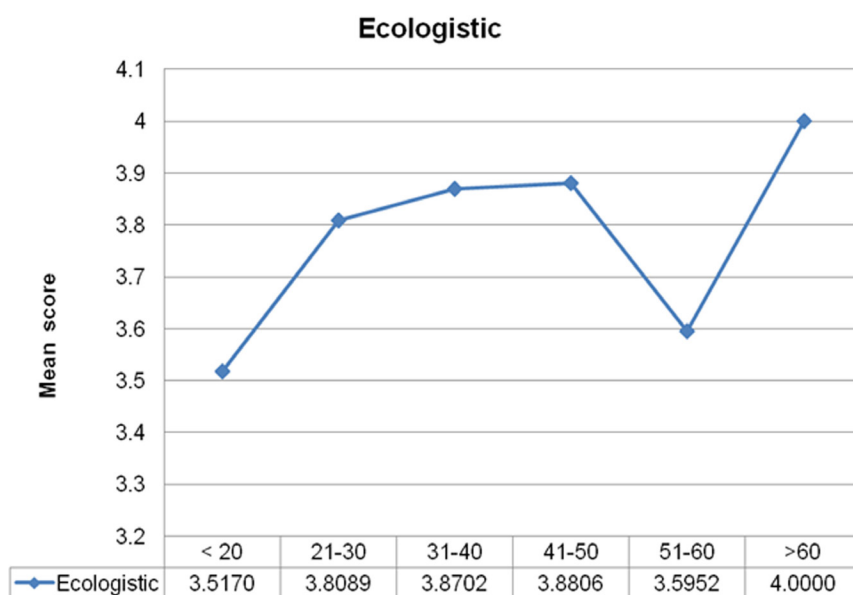
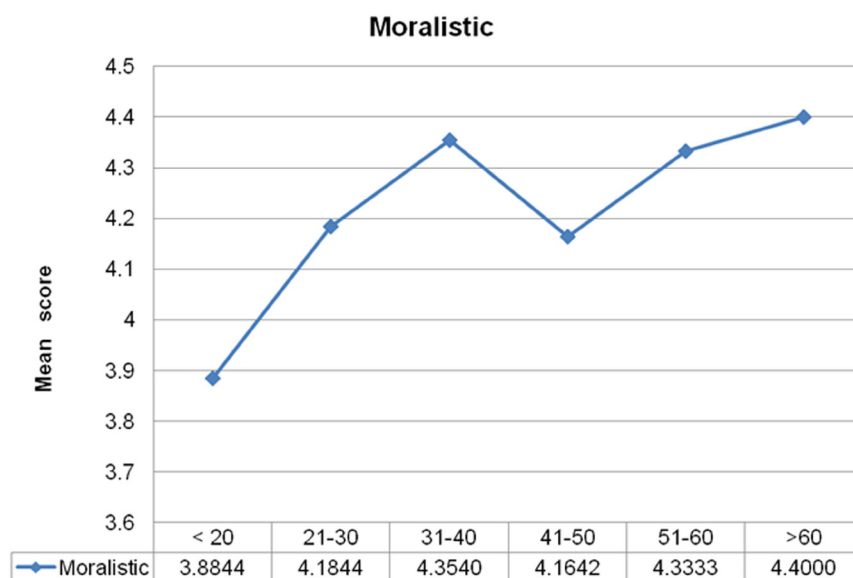


Figure 3: Moralistic value and age of respondents



Effect of Gender on Values

The gender attribute was investigated in relation to values with regard to urban biodiversity. The values had significant differences between the genders. Moralistic, aesthetic and utilitarian values were found to be significant with all the values presented as $p < 0.05$: moralistic, $F = 4.046$, $p > 0.05$; aesthetic, $F = 4.945$, $p > 0.05$; and utilitarian, $F = 5.509$, $p > 0.05$ (refer to Table 10). The result indicated that male respondents perceived more moralistic and utilitarian values compared to female respondents. Thus, this indicated that male respondents had more concern about how animals were treated. Furthermore, the male respondents indicated that they had lower primary concern for the practical and material use of animals compared to concern expressed by female respondents.

On the other hand, female respondents perceived more aesthetic value toward wildlife. That is, more interest in the artistic and symbolic characteristics of animals and vegetation. However, in comparison to other values, the aesthetic value had a lower mean score: for example, female respondents scored 1.8004 and male respondents scored 1.6683.

Values	Gender	Mean	Std. Deviation	F	Significance level
Moralistic	Male	4.2585	.64494	4.046	0.045*
	Female	4.1276	.65906		
Aesthetic	Male	1.6683	.55767	4.945	0.027*
	Female	1.8044	.66561		
Utilitarian	Male	2.7724	.89369	5.509	0.019*
	Female	2.9847	.91788		

Table 10: Values and gender of respondents

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

Effect of Respondents' Level of Education on Values

Education level was analysed to assess its effect on people's values with regard to urban wildlife. The result indicated that there were significant differences in terms of responses on four values according to education level. These were ecologicistic value, $F = 4.041$, $p < 0.001$; humanistic, $F = 3.56$, $p < 0.01$; moralistic, $F = 8.454$, $p < 0.001$; and aesthetic values, $P = 3.248$, $p < 0.01$ (refer to Table 11).

In general, the ecologicistic and moralistic values increased with improvements in scores according to education levels. The higher the level of education, the higher the level of values and educated people were more concerned about wildlife ecosystems and agreed that wildlife should be conserved, maintained and promoted, by firstly taking care of ecological balance and wildlife health.

However, in terms of both the humanistic and aesthetic values, the result indicated that these values decreased with higher levels of

education. Lower education levels had higher mean values compared to higher education levels. That is, appreciation for humanistic and aesthetic values slowly disappeared from people who attended higher level educational institutions.

Table 11: Values and level of education

Value	Level of Education	Mean	Std. Deviation	F	Significance level
Ecologistic	Primary school	3.3704	.53863	4.041	0.001***
	Secondary school	3.6622	.57079		
	Certificate	3.5357	.60410		
	Diploma	3.7805	.59771		
	Bachelor	3.8957	.62363		
	Master	4.0404	.61100		
	Doctorate	4.0833	.16667		
Humanistic	Primary school	2.6667	.50000	3.56	0.002**
	Secondary school	3.1422	.71276		
	Certificate	2.7976	.81316		
	Diploma	2.9553	.76759		
	Bachelor	2.7096	.80733		
	Master	2.6970	.77443		
	Doctorate	2.3333	.47140		
Moralistic	Primary school	3.4444	.88192	8.454	0.000***
	Secondary school	3.9733	.61698		
	Certificate	3.9167	.68268		
	Diploma	4.1138	.70899		
	Bachelor	4.3885	.55834		
	Master	4.4343	.59794		
	Doctorate	4.0000	.00000		
Aesthetic	Primary school	2.3333	.83333	3.248	0.004**
	Secondary school	1.8711	.55587		
	Certificate	1.8452	.57005		
	Diploma	1.7480	.70771		
	Bachelor	1.6421	.59555		
	Master	1.5758	.47341		
	Doctorate	1.7500	.50000		

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

DISCUSSION

Environmental protection has gained importance since 1900 and awareness on environmental issues and management in urban planning has gradually increased. Leopold was the pioneer in the field of wildlife management and elaborated his interest in his book 'Game Management' (1933). Several scholars have used his initiative to expand environmental studies especially in wildlife management (Shaw 1985). Since 1960s there was a shift towards being more environmentally friendly (Miller and McGee 2001). Recently, in the 21st century, efforts are underway towards policies and management in many cities globally. Studies on environmental attitudes are important in order to understand individual, cultural, regional and countries' views on local environments. Rauwald and Moore (2002, p. 710) stated that "[s]upport for environmental policies is important because without public support it is difficult for any government to institute new policies to protect

the environment". The integration of "[h]uman dimension information and environment information is a new approach especially in wildlife management" (Miller and McGee 2001), and it has not been considered much in urban planning and design. Since then, many approaches have investigated environmental concerns, approaches and theories.

This research has applied Kellert's typology to investigate values towards the environment, especially wildlife. According to Rauwald and Moore (2002, p. 711) the theoretical approach purposefully searches the "fundamental aspect of contemporary human-animal relationship". He also stated that "Kellert's questionnaires, which are always adapted to reflect local issues and assess attitude and underlying value orientation..."

This research investigated and presented outcomes of the study of environmental attitudes towards urban wildlife in urban parks of Kuala Lumpur. The research found that stakeholders and residents in Kuala Lumpur held moralistic values, indicating responsibility in environmental justice and ethicality. It also meant that people had a strong pro-environmental attitude towards urban biodiversity and nature. It also presented that a city in a developing country such as Kuala Lumpur held moralistic values. A study by Rauwald and Moore (2002) presented similar findings. For example, they found that students from Trinidad and the Dominican Republic scored higher in moralistic/aesthetic values over American students. Kellert (1985) discovered in his study of American attitudes in American newspapers between 1900 and 1970 that they held utilitarian attitudes. Furthermore, his study in 1984 indicated that urban residents of America held humanistic values. Rauwald and Moore (2002, p. 723) recently confirmed that American students held higher humanistic values compared to the two countries, Trinidad and the Dominican Republic.

Another study in Victoria, Australia by Miller (2003, p. 469) on the Victorian public and wildlife management stakeholder groups found that "[i]n all groups, the humanistic and curiosity/learning/interacting were the most strongly expressed values. People in Victoria appear to have a relatively strong emotional attachment to individual animals and are interested in learning about wildlife and the natural environment". In the 21st century, in both developed and developing countries, the values towards wildlife have become significantly positive and wildlife management and conservation should become one of the important factors especially in urban development. Miller (2003, p. 465) found that "many stakeholders have recognized the importance; however, they also believe that its application is more difficult". As Miller and McGee (2001, p. 218) put it, "there can be considerable discrepancies between wildlife manager's belief, and values of wildlife held by stakeholder groups and the public that they serve". They have found that if the manager misunderstood the members' values in relation to the environment, it could affect their planning and management.

With regard to this, to ensure the conservation of urban biodiversity, it is recommended that the City Hall of Kuala Lumpur incorporate the studied environmental attitudes of stakeholders and the community. This research shows that stakeholders and residents hold moralistic values with strong environmental attitudes. Many countries have tried to incorporate this 'human dimension' by working in partnership to manage biodiversity Gigliotti (1998 cited in Miller and McGee (2001, p. 217), who also state that "wildlife management objectives are driven by the community, and it is therefore important to recognize and understand community values".

In relation to gender, the study found that male respondents scored significantly higher on moralistic values, whereas female respondents scored significantly higher on aesthetic and utilitarian values. These results were different to Rauwald and Moore's (2002) findings that indicated that women scored significantly higher than men in the moralistic value. However, his further test indicated that it was only in the United States that women students scored higher than men, and there were no significant differences in the other two countries investigated. Miller and McGee (2000, p. 60) found that the utilitarian value scored higher among males: "males were more likely than females to express a desire to control wildlife through consumptive wildlife activities. Males also were more likely to express an interest in the practical value of the land associated with wildlife". This finding differed from our research which found that female respondents scored significantly higher than male respondents on the utilitarian value. However, for the aesthetic value, Miller and McGee (2000, p. 60) had similar results as in these findings.

CONCLUSION

Environmental attitudes towards urban biodiversity were investigated with a focus on wildlife, and the outcomes were presented. The role of urban parks in terms of the preservation of these environmental attitudes especially wildlife is significant. An integrated approach emphasising the 'human dimension' and scientific information has been received with various perspectives. Changes in the landscape fabric of the city, both physically and socially may reflect the interaction between people and biodiversity. Participating in biodiversity conservation needs to have a new dimension and a close relationship between all parties.

This environmental attitude study focused on values and has been integrated with other variables such as attitude, knowledge and behavior. Demographic and non-demographic factors indicate this relationship and could be used to enhance urban ecology and management in cities. Thus, the findings provide information about people's values with regard to urban biodiversity in Kuala Lumpur's urban parks. This would be useful for authorities such as the ministry, local authorities, agencies and professionals, to assist cooperation on planning, and the development of strategies for urban biodiversity at their respective levels.

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