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Addressing public dissatisfaction on urban tree management: A way to enhance landscape quality

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ABSTRACT

Despite the vast research by scholars on urban tree management, little is known about the perspective of public dissatisfaction in relation to the tree management status. The overall viewpoint that emerges from the literature is negative: Slow reaction, complaint-based action, mismanagement and incompetence. To justify and fully enhance landscape quality, it is important to address and minimize public dissatisfaction factors. The aim of this initial study in Kajang was to contribute to the emerging understanding of public dissatisfaction on urban tree management performance. This study presents the analysis of 640 public applications for tree removal due to dissatisfaction derived from the Kajang Municipal Council localities of which the information originates from a public complain database. From public applications for tree removal, their dissatisfaction factors are categorized into 5 major traits on tree management performance; garbage generation, dangerousness, oldness, poor workmanship and interference or obstruction under 4 criteria; management intensity, species suitability, tree risk management and staffing. The outcomes add nuance to the understanding of the trees that have received an application for removal–it indicates that they are poorly managed. This study set the standard in urban tree management journals and differences from other studies with the addition of two variables which is the poor workmanship and interference or obstruction for indicating the performance of urban tree management. In using an untapped source of primary indicators; public dissatisfaction statement with tree management; this study will contribute to future research on similar topics and light up the existing ambiguity on tree management performance.

1. Introduction

Preferences for urban trees have been comprehensively described in the literature, e.g. the residents' preferences rely on the dimensions of crown size and crown density (Gerstenberg and Hofmann, 2016), their perception of safety to public (Hami et al., 2014; Yang et al., 2013), and their desired presence of tree type or size (Camacho-Cervantes et al., 2014; Conway and Bang, 2014). The resident's support of and participation in planting program to the municipal urban tree efforts has also been investigated (Conway and Bang, 2014; Fors et al., 2018; Watkins et al., 2018; Zhang et al., 2007). Other studies describe the resident's preferences influence on characteristics of the residents (Fernandes et al., 2019). The quality urban trees are believed to be accepted and being appreciated by the public.

Fors et al. (2018) found public participation in tree management and maintenance positively influenced perceived quality of urban trees. This is in line with their needs and requirements toward benefits that trees could provide (Conway and Bang, 2014). People support urban trees performance through various contributions such as contributing good opinions and suggestions, helping reduce maintenance costs and assisting preservation efforts (Jones et al., 2013). Otherwise, they tend to be tree haters due to dissatisfaction with the tree performances (Fernandes et al., 2019) and in worst-case scenario, they harm the trees (Richardson and

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Shackleton, 2014). Undeniably, the key for urban trees survival and longevity, is that they should be managed effectively, meet the public preferences and acceptance.

However, this view is challenged by recent finding which indicates that more residents perceive poor urban trees conditions as dangerous elements (Fernandes et al., 2019). Previously, Maruthaveeran (2016) found that people felt unsafe in a surrounding with unmaintained trees.

A considerable amount of research has also studied public dissatisfaction with urban trees qualities but less attention has been paid to the tree management performances. As a result, no relevant guideline is available to improve tree management performance. The question remains whether or not public dissatisfaction with tree management stems from poor urban trees quality. Hence, additional studies on public dissatisfaction on urban tree management are required. The aim of this paper is to identify the deficiency of tree management performance that sparks public dissatisfaction. This study presents data on tree management deficiency through analysis of public dissatisfaction with urban tree conditions in Kajang Municipal Council localities. The results indicate that this method is effective in guided urban tree management improvements. The paper is structured in four sections. The second section clarifies the methodology and the third section lays out the results of the study. Finally, the fourth section provides conclusions and suggestions for future research.

2. Method

2.1. Study area

This study was conducted in Kajang Municipal Council (MPKJ) localities, Malaysia. MPKJ's areas have experienced rapid urbanization over the past twenty years and are still growing accompanied by a rapid acceleration of Klang Valley economic development. It is strategically positioned for the residential and commercial area as the area is adjacent to the national capital of Malaysia Kuala Lumpur, national administration center Putrajaya and the main entrance of the Klang Valley from the south of Malaysia. MPKJ covers an area of 787.61 km^2 (MPKJ, 2015) and boasts a human population that exceeds 1,138,198 (DOSM, 2017). The economic performance of the city relies almost entirely on the industrial and commercial sectors, with some service sectors in its peripheries such as tourism and education. MPKJ has almost 224.53 km^2 built-up areas that cover the area for residential, industrial, commercial, infrastructure and utility, park and open space and transportation (MPKJ, 2015). Overall, these areas have scattered trees in planting space provided such as road reserve, buffer zone, green area, gardens, side-walks and river reserve, which comprise primarily of Rain Tree (Samanea saman), Batai Laut (Peltophorum pterocarpum), and Rhu Pantai Batai (Casuarina equisetifolia), Tecoma (Tabebuia spp.), Cempaka Putih (Michelia alba), Kayu Manis (Cinnamomum spp.) and Kiara Payung (Filicium decipiens) (MPKJ, 2011).

2.2. Data collection and analysis

Records of 640 public's tree removal applications received by the Kajang Municipal Council in 2016 were used as the empirical material for the study. The defining of dislikes of a tree, suggested by Camacho-Cervantes et al. (2014) as "qualities or properties of urban trees that are perceived as unhealthy for human well-being," was taken as a starting point. All applications for trees removal by the public were considered as perceived preliminary evidence of public dissatisfaction with urban tree management.

The primary intention of the study was to select items related to tree situations from the records. The traits of dislike for urban trees condition listed by Camacho-Cervantes et al. (2014) were used to classify the items into categories, as they appeared to be the most appropriate methods available. Each item was classified into four categories: Garbage generation, dangerousness, oldness and shadeless. The classification was used to describe what had happened in each case and the cause of the dissatisfaction. The data were analyzed statistically using the Statistical Packaging for Social Science (SPSS) version 20 and results were indicative of the management performance status based on urban forest planning and management model adapted from Kenney et al. (2011) which is established by Clark et al. (1997).

3. Result and discussion

The study found 747 items and 5 traits from public dissatisfaction on urban tree management (Table 1). In contrast to the study by Camacho-Cervantes et al. (2014), the findings of this study added 2 traits for public dissatisfaction on urban tree management which is the 'Poor Workmanship' and 'Interference/Obstruction' traits. However, this study found that the 'Shadeless' trait was insignificant. The highest contributing factor at 57.0% is the dangerousness trait followed by interference or obstruction trait (29.0%). These two traits also exhibited high frequency in applications (Fig. 1) and were significantly correlated with the overall monthly traits (dangerousness trait, r= 0.79; interference or obstruction trait, r= 0.55) which can be considered a large effect. Another 3 traits were significant as well, except shadeless traits since no application was recorded.

The poor performance of urban tree management has generated significant public dissatisfaction effects. Table 2 shows the dissatisfaction factors affected tree management status according to the criteria and performance indicators distribution. In order to improve the urban tree management performance, it is imperative to consider the

sensitivity of local people when making urban planning and management decisions (Camacho-Cervantes et al., 2014). In general, the results of this study concur with the findings of previous studies related to life quality, human behavior and environment (Badrulhisham and Othman, 2016; Gerstenberg and Hofmann, 2016; Othman et al., 2015).

Table 1: Categories of items: Recorded causes of perceived disliked related to tree removal applications in Kajang Municipal Council, Selangor, Malaysia (Applications for tree removal (n=640))

Traits (Camacho-Cervantes et al., 2014)	No. of items (% of total)	Example of Item
1. Garbage generation	54 (7.0%)	The leaves fall and stain my home area. Please cut it.
2. Dangerousness	427 (57.0%)	Large trees on the side of the road, worrying about the tree fall into the house and hit the vehicle.
3. Oldness	12 (2.0%)	Old trees and decaying are quite dangerous to the residents.
4. Shadeless	0 (0%)	-
5. Poor Workmanship*	37 (5.0%)	Please cut this tree because it has not been maintained.
6. Interference/Obstruction*	217 (29.0%)	The tree has blocked the streetlight. Please cut the tree.
Total	747 (100%)	

Asterisk (*) indicates subcategories added in the present study

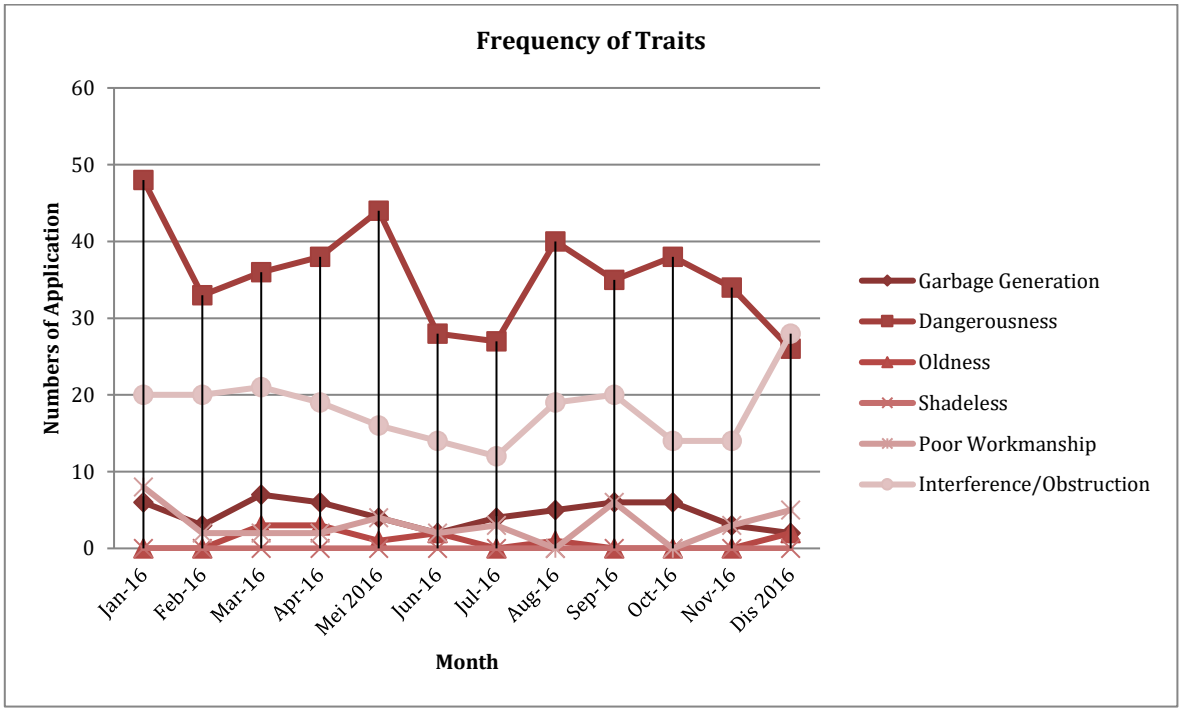

Fig. 1: Tree removal applications frequency for Kajang Municipal Council in 2016

Table 2: Recorded dissatisfaction factors affected tree management status according to the criteria and performance indicators suggested by Kenney et al. (2011) and Clark et al. (1997)

Criteria	Performance indicators (Low/Moderate/ Good/Optimal)	Status
A. Community Framework		
1. Condition of publicly owned trees (trees managed intensively). • Oldness	Low	No tree maintenance or risk assessment. Request based/reactive system. The condition of the urban trees is unknown.
2. Species suitability. • Interference/Obstruction.	Unknown	A percentage of tree population suitability is unknown.
B. Resource Management		
1. Maintenance of publicly owned, intensively managed trees. • Garbage generation.	Moderate	Publicly owned trees are maintained on a request/no reactive basis.
2. Tree risk management. • Dangerousness.	Low	No tree risk assessment/remediation program. Request based/reactive system.
3. City Staffing • Poor Workmanship	Moderate	No training for existing staff.

Considering the requisition of MPKj's residents, using the actual of social concern in a wide sense, Table 3 shows that people's dissatisfaction with the management refers to maintenance intensity, species suitability, the tree risk management and staffing of which underlies the most safety concern (Fernandes et al., 2019; Hamzah et al., 2017). The highest dissatisfaction in tree management performances

concerns failure to maintain their management intensity as the indicator classified this as having a low performance. Moreover, the failed implementation of tree risk management was the reason behind the residents' dissatisfaction with tree management else well.

Table 3: Resident's dissatisfaction with urban tree management performance

Tree management	Traits	Management Performance	Item Concern
1. Management intensity	Oldness	Low.	Safety
2. Species suitability	Interference/Obstruction	-	Safety
3. Tree risk management	Dangerousness	Low.	Safety
4. Staffing	Poor workmanship	Moderate.	Safety

4. Conclusion

If tree managers aim to improve the management quality and performance competency, it is crucial to understand what motivates people's satisfaction. Conducting studies that take into consideration what community recognizes and thinks about the situation they live in, provides an important opportunity to consider humans' role as not limited only in the urban tree and environmental sustainable factor, but also as stakeholders and service providers. Based on the results, this study suggests that future tree management practices in urban areas should give more emphasis on the following tree management framework: Management intensity and tree risk management. In addition, the researchers suggest that urban tree management should focus on species suitability and staffing framework due to the people's satisfaction concern. As shown in the findings, people have diverse satisfaction and dissatisfaction factors that should be taken seriously, while executing urban tree management that could affect management performance directly. Undoubtedly, further studies are needed to broaden this understanding of human dissatisfaction in relation to urban tree management performances.

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Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

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