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Municipal Tree Management in a Nigerian University

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Abstract
There is a growing recognition that municipal trees improve the quality of life in many ways through the provision of both goods and services. For proper tapping of these benefits, urban residents also need to manage the municipal trees sustainably. Thus, the study is carried out to assess the management technique for the municipal trees in University of Ibadan campus. A technical assessment of the activities of the operations crew of the Campus Tree Management Committee saddled with the responsibility of managing the trees was carried out for a period of five years. Using a checklist and job profile form, information were collected on tools and equipment used by the tree management committee; number of request per year; location and number of treated cases; species of the treated cases; types of treatment provided; working conditions of the crew and methods adopted; efficiency of the operations; and hazards and safety of the operations team. Data collected were analyzed using descriptive statistics.

The study revealed that all the stakeholders appreciated the importance of the municipal trees on campus. Fifty eight percent of the requests and 100% of emergency cases were attended to and a total of 369 trees of different species were treated. The crew members are experienced in urban tree management, but there is need to procure modern equipment for tree management in residential areas to reduce the work stress and hazards of the job. There is need to involve the entire University community in the management of the trees through development of policies that will minimize the disturbance of municipal trees, promote a tree friendly attitude in relation to development and expansion. Considering the number of dangerous trees being removed presently on the campus, there is therefore the urgent need to improve on the efforts to plant new trees.

Key words: Campus tree, municipal tree, management,

INTRODUCTION

Trees of the University of Ibadan are important assets that have long been admired for their roles in the beautification of the University landscape. A large percentage of these trees were either planted or deliberately left on their natural site to provide conducive micro-climate or protect the environment. These trees, old and hollowed, have remained for so many years an inseparable part of the University. Apart from the fact that these trees are of great cultural and social values to the University community, they also have historical significance in the life of University of Ibadan. (Osundare 1994). The municipal trees on the campus are assets that require special care and maintenance just like any other public properties. The many changes in the University campus over the last fifty (50) years have greatly stressed many of these trees resulting in decline tree canopy that is grossly under-managed. Therefore, the strategies for effective management of these trees on sustainable basis are required.

The benefits of properly managed municipal trees as documented by researchers, amongst others, include: provision of shades and reduction of radiated temperature from buildings and roads thereby reducing energy use in the temperate, absorption of pollutants as tree mop up carbon dioxide to release oxygen much sought for by most organisms, prevention of soil erosion, enhanced recreational areas, and protection against ultra violet rays. Municipal trees equally help to reduce noise pollution by providing a dense barrier of sound deadening vegetation and branches rustle to the obtrude noise thereby helping to cancel noise out. Brenner *et al* (1995), Aston (1985), Omole (2004), McPherson (1994). Because of these and other benefits people, not only prefer to live and recreate in well maintained environment with trees, but are willing to pay extra for the privilege (Dwyer et al, 1989) As highlighted by Council of Tree and Landscape Appraisers (CTLA 2000), municipal trees contribute to increased quality of life for the community and their residents. Most people prefer to live recreate and work in community of healthy and well maintained environment.

Several efforts are being made to properly manage these trees in the recent past but these have not yielded the desired results because the management of these trees was at different times carried out by non professionals. This led to gross under management of the trees with some growing into bad forms and many also growing on a wrong site. Apart from this, there is general low awareness on the part of the residents on the Campus of the benefits of these municipal trees. This is evident in the way some residents treat this public property within

their residential areas by driving nails into living trees and in certain instances setting the trees on fire.

The management of these trees has attracted the interests of all the stakeholders in the University community. There is a standing committee saddled with the responsibilities of managing all the trees on campus. Although the management of existing healthy trees and removal of dangerous ones within the campus is central to the committee, the aim of the committee is not to turn the campus into a desert. The responsibility of the committee is to improve the quality of the environment and, at the same time, preserve the serene physiognomy of the University. These goals can only be achieved through a comprehensive approach, which will give equal importance to both infrastructural development and environmental preservation. Proper perspective and a balanced approach are essential if both objectives are to be harmoniously achieved. The study is thus carried out to technically assess the management procedure of the municipal trees within the campus, taking into consideration the status of the trees, the dangers posed or threat to proper management and challenges. Specifically, the research is to: study and document the present management procedure for the trees and identify the problem affecting the efficiency of the operations team; assess the level of productivity and response to emergency cases; compile data on the magnitude of inherent dangers; document the occupational hazard exposed to by the operations team, and; propose an appropriate management technique with improved productivity.

MATERIALS AND METHODS

The study was carried out in the University of Ibadan between January 2002 and December 2006. The University is situated about six kilometers to the north of the city of Ibadan in Oyo state (latitude 7^0 5'N and longitude $3^0$54'E with the mean altitude of 227 metres above sea level). The soil is freely drained, mildly acidic and of moderate fertility in the river valley with numerous outcrops of basement complex rocks of Precambrian ages. The climate of the area is of the equatorial type having dry and wet season. The dry season is from November through April and the mean annual rainfall is 1220mm most which is obtained between April and October.

Data Collection

Data were collected using a checklist and job profile form. Information collected includes tools and equipment used by the tree management committee, number of requests per year, location and number of treated cases, species of the treated cases, types of treatments provided (felling, trimming or cross-cutting), working conditions of the crew and methods adopted, efficiency of the operations, hazards and safety of the operations team. Using the checklist, information was collected from members of the community who applied for the services of the Committee on the present level of management of the campus trees. Data collected were analyzed using descriptive statistics.

RESULTS AND DISCUSSIONS

The average number of request per year is 72 while the average number of treated cases was 42 representing 58.2 percent (Table 1). The total number of requests for the whole period covered by this study was three hundred and sixty (360) and the total number of reported emergency cases was seventy nine (79) with an average of about sixteen (16) per year. The untreated cases of request were those believed not to be posing serious dangers as reported by the clients after inspection. Some of these clients probably applied for the trees to be treated either due to ignorance or as a result of perceived phobia for urban trees.

Table 1: Years of Operation and number of Treated cases

Years	No of Request/Yr	No Treated/Yr	Untreated	Percentage treated	Emergency cases	Treated
2002	68	38	30	55.8	16	16
2003	56	32	24	57.1	22	22
2004	83	51	32	61.4	13	13
2005	75	48	27	64.0	15	15
2006	78	41	37	52.6	13	13
Total	360	210	150	58.2	79	79

Tools and Equipment

The tools and equipment being used by the operations crew are chain saws, cutlasses, hand ropes, chisel and wooden mallet, sledge hammer, monkey winch, single and double ladder for climbing and in certain instances mechanical ladder for very tall trees. Although, these tools and equipment are very good for urban tree management, they are not adequate for the magnitude of work required for sustainable management of the trees on the campus. There is need for mechanization of some of the operations. For instance the operations crew is still involved in manual handling of off-cuts which leads to inability of the crew to clear the site immediately after operation (Plate 1).

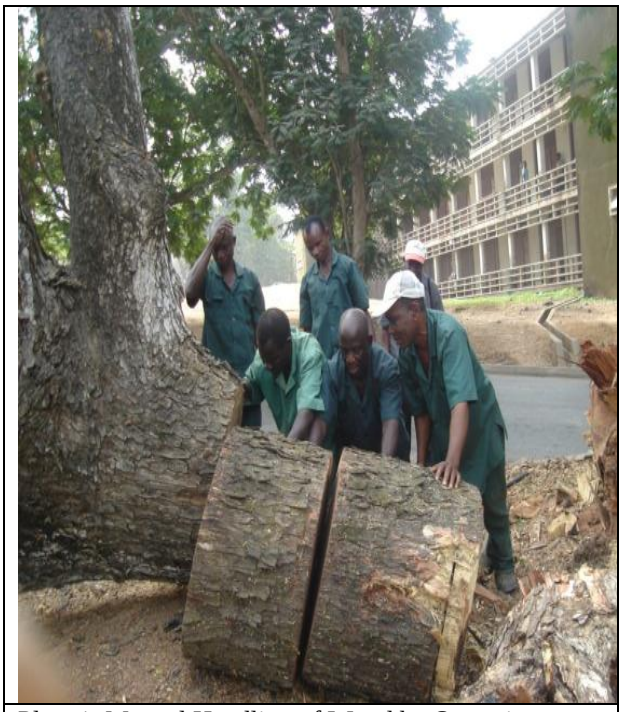

Plate 1: Manual Handling of Wood by Operations Crew

The maintenance activities of the operations team were carried out in all parts of the University
including academic and administrative areas and even in residential areas of the campus (Table 2). The total number of trees attended to was three hundred and sixty nine (369) within the duration of the study. Amina way and Abadina community had the highest concentration of treated cases of 68 trees representing 18.43% of the total trees attended to. Apart from normal requests some trees were also removed during this period to pave way for infrastructural development as is the case of Faculty of Law and Arts. These categories were also added to the treated cases.

Delonix regia has the highest number of treated cases per species (Table 3). The total number of treated cases was 93 which are over 25 percent of the total number of tree attended to during the period.

This species is the commonest species on the campus today with so many of it growing freely and in many instances on the wrong sites. The species has very shallow roots and the species is easily affected by root/stem rots resulting in heavy damages even with little storm

Types of treatment

This has to do with the various maintenance practices adopted for the handling of the dangerous and hazardous trees on campus. The trees marked for removal are those that pose hazards to life and property and those necessary to be removed for construction works and other developmental projects. The major treatments adopted by the operations crews are trimming, complete tree removal, and disposal of tree debris. Trimming involves: Crown cleaning (removal of dead, diseased and broken branches), crown raising (removal of low branches for safe movement), and crown reduction (reduction of the overall mass).

Table 2: Location of the Treated Cases within the Campus

Location	No of Treated Cases
Abadina	22
Amina way	46
Carr road	6
Physiology Department	8
Pepple road	11
Faculty of Science	12
Forestry Department	12
Ekwunno road	5
Faculty of Arts	12
Jaja	12
Mellanby Hall	12
Tedder hall	13
Independence Hall/New Barth road	18
Staff Club	7
Waidei Martins	12
Benue Road	11
Niger Road	12
Faculty of Law	13
Lady Bank Anthony	5
Veterinary Anatomy	5
Parry Road	17
Sankore/Lisabi	13
Ijoma	12
Postgraduate school/Pharmacy	13
Elkanem Road/Fish pond	28
Social Sciences	13
Geology Department	6
International School	13
Total	369

Failure in the Trees

Investigations revealed that municipal trees of University of Ibadan also have some negative impacts such as messy fruits, allergenic properties and infrastructure damages (e.g. damage to building and sidewalks). Some of the dangerous trees identified and removed can cause damages or personal injury, particularly during natural loading events such as winds and storms. Although these trees are subject to similar environmental stresses like other trees in the forests, campus trees are more vulnerable because they are usually sparsely located within built-up areas and thus susceptible to direct wind attack. Most of the treated and failed trees have some defects which predispose the risk of tree failure and generally most of the trees failed because the load exceeded the mechanical strength of the branches, stem

and roots. Five categories of defects leading to failure were identified with the trees on campus. These are, decayed wood, root problems, weak branch union, poor tree architecture, and dead trees, tops or branches. Most of these defects may be linked to past wounds and decay, biodeterioration, severe storm and/or the growing condition that limited their root development (Plates 2 and 3) . Other forms of failed trees are the storm damaged trees which normally occur as a result of heavy storm at the beginning of the raining season or towards the end of the raining season. These categories accounted for majority of the emergency cases treated.

Table 3: Number of Treated Cases per Species

Species	No of Treated Cases
Afzelia africana	5
Albizia spp	21
Anacardium occidentale	11
Antiaris toxicaria	11
Azadirachta indica	19
Blighia sapida	10
Cassia alata	13
Ceiba pentandra	7
Daniellia oliveri	4
Delonix regia	93
Elaeis guineensis	17
Entandrophragma angolensis	3
Eucalyptus occidentale	6
Gliricidia sepium	23
Gmelina arborea	8
Irvingia gabonensis	5
Khaya ivorensis	5
Mangifera indica	28
Milicia excelsa	11
Newbouldia laevis	13
Psidium guajava	3
Samena senna	10
Tectona grandis	6
Terminalia catapa	25
Terminalia superba	3
Triplochiton scleroxylon	9
Total	369

Plate 3: Decayed stem of wood marked for removal

Plate 2: Fallen tree resulting from root decay

Tree Management Hazards

Although the tree management crew is provided with basic safety gadgets such as boots, helmets, hand gloves and ear protector, they are still exposed to many hazards amongst which are, smoke from the exhaust of the machine, noise, vibration, dust and on so many occasions wild insects and animals such as bees and snakes. Apart from the aforementioned hazards other challenges encountered by this crew are trees to be removed that had already entangled with electrical cables. These place a high demand on the operations crew both physically and mentally. In spite of these challenges only a very few cases of accidents (seven) were reported during the duration of this study.

Working condition of the crew

The operations team responsible for the management of the campus tree is made up of 8 members comprising two plant operators, and six gardeners/felling assistants. All the crew members are highly knowledgeable about the present management technique being used on the campus. None of the crew members has gone for any special training on municipal tree management since they joined the crew. The average age of the crew members is fifty-four years because only one of the members is below the age of forty with the rest being above fifty years of age. This has greatly affected the efficiency of the crew as tree management operation is a very tedious work that requires high physical energy. In spite of this, the crew members are still very happy with the responsibility of managing the trees on campus.

Stakeholders' Assessment

Trees are an indispensable part of the natural life support system which play a vital role in the sustainability of the University landscape. The study revealed that there is a growing awareness that municipal trees improve the quality of life in many ways through the provision of both tangible and intangible benefits.

All the stakeholders in the University Campus are convinced that proper management of the trees cannot be done without the participation and cooperation of the entire community. This is necessary because there will always be a common interaction among people, property and trees in the University community. To achieve this there is need for proper re-orientation of the residents on campus on the need for sustainable management of the campus trees and the benefit to humanity.

CONCLUSION

The location and species of the trees on University of Ibadan campus plays a large role in ensuring the survival and health of the trees. The equipment and tools currently being used by the operations crew are efficient but not adequate to handle the magnitude of requests on campus. There is also the need to engage more hands and allocate more funds to replenish and manage the trees as part of our millennium development goals.

Since there will always be a common interaction among people, property and trees in the University of Ibadan campus, removal and correcting of tree (pruning, cabling and bracing the defects) is therefore recommended as strategies to reduce the risk posed to public safety by the tree. There is also the need for the University to develop policies that will minimize the disturbance of municipal trees, promote a tree friendly attitude in relation to development and expansion. Considering the number of dangerous trees being removed presently on the campus, there is therefore the urgent need to improve on the efforts to plant new trees.

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