# Issues and Options for Appropriate Management Strategies of Campus Trees at University of Ibadan, Nigeria

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**ABSTRACT**
This study assessed the significance of trees in University of Ibadan with a view to recommending appropriate management strategies. Respondents for the study include teaching staff, non-teaching staff and students. Shade producing trees ranked the highest among the preferred campus trees. Meanwhile, about 92% of the respondents disagreed that there is effective tree management on the campus. Delay in response to distress calls ranked highest (33%) of the complaints of the operations and management of campus trees. Frequent inventory and survey of trees on campus should be carried out; there should be provision of funding, modern equipment and on-the-job-training to the campus tree management committee; and a survey of the tree preferences of the residents should be conducted when planning for the tree planting programme.

**Keywords:** Preference for campus trees, campus occupants, Campus Tree Management Committee, urban forestry

## INTRODUCTION

Trees have probably been part of cities since their first development (Adeniyi, 1975; Ward, 1992; Nillsson, 2000). Since agriculture led to the first permanent settlements, it stands to reason that domesticated plants were a part of the community, including trees cultivated for food (Valencia, 2000). The early Egyptians described trees transplanted with balls of soil more than 4000 years ago. In thirteenth-century China Kublia Kahn required tree planting along all public roads in and around Beijing for shade (Wiki, 2002). Although tree planting is carried out in many different parts of the world, tree management strategies may differ widely across nations and regions.

Urban forestry is the careful care and management of urban forests, i.e., tree populations in urban settings for the purpose of improving the urban environment (Strom, 2000; Knuth, 2005). Urban forestry is a relatively new, multidisciplinary approach in international forest research. As defined in The Dictionary of Forestry by the Society of American Foresters, urban forestry is the *art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society* (Helms, 1998). The Ontario Professional Foresters Act (OPFA) (Canada) defines "urban forest" as "*tree-dominated vegetation and related features found within an urban area and includes woodlots, plantations,*

*shade trees, fields in various stages of succession, wetlands and riparian areas*" (Knuth, 2005). Another emerging area in urban forestry is "urban and peri-urban forestry and greening" (UPFG).

Urban forestry advocates for the role of trees as a critical part of the urban infrastructure while urban foresters plant and maintain trees, support appropriate tree and forest preservation, conduct research and promote the many benefits trees provide (Ajewole, 2001). Traditionally, the forestry sector neglected the urban environment, paying more attention to the rural areas. Nowadays, the sector tends to include more comprehensively the concept of "trees outside forests", with an improved approach to landscape management, agroforestry and urban forestry.

The list of goods and services that urban forestry can provide is impressive. Trees and green spaces help keep cities cool, act as natural filters and noise absorber; improve microclimates and protect and improve the quality of natural resources, including soil, water, vegetation and wildlife. Trees contribute significantly to the aesthetic appeal of cities, thereby helping to maintain the psychological health of their inhabitants (Nowak, 2000). Beyond ecological and aesthetic benefits, urban forestry has a role in helping resource-poor populations meet basic needs, particularly but not exclusively in developing countries (Mudrack, 1980). Urban forest functions are thus often oriented toward human benefits,

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such as shade, beauty, and privacy (Dwyer *et al.*, 1991). Moreover, urban green provides an essential structural and functional contribution to cities so as to make them more attractive and liveable in terms of aesthetics, improved urban recreation, and access to clean air and a serene environment (Ulrich, 1990; Grey and Deneke, 1992; Clamp, 1995)**.**

Urban forestry can be studied and practiced from multiple perspectives that vary in focus over time and according to the developmental stage in different countries. For example, in developed countries, a prime focus in the past was management of the urban forest for aesthetic purposes, whereas now, as urban populations have grown, intensified, and expanded, it has shifted to management for enhancing ecosystem services (Dwyer *et al.*, 1991). In developing countries, a more important focus may be managing vegetation to provide materials, such as firewood, fruit and timber, at very local scales. Since urban forestry includes activities carried out in the city centre, suburban areas and the "urban fringe" or interface area with rural lands, forestry activities can differ significantly according to the zone. In central areas, the potential for significant new urban forestry efforts are relatively limited in most cities (Ajewole, 2001). Here, it is mainly an issue of maintaining or replacing trees planted long ago. Furthermore, studies have shown that people develop emotional attachments to trees that give them special status and value (McPherson *et al.*, 2002). Removing hazardous trees can therefore be difficult when it means severing the connection between residents and the trees they love (Egunjobi, 1989). For many, a feeling of attachment to trees in cities influences feelings for preservation of trees in forests (McPherson, 1998).

According to Carreiro and Zipperer (2008), the recent phenomenon of shrinking cities creates new opportunities to rethink urban planning and green space distribution. Opportunities for greening cities as part of a path toward developing into an eco-city will also vary with economic status and changing demographics of cities. For example, the needs and opportunities for tree and vegetation planting will differ greatly between the rapidly growing cities of developing nations and post-industrial shrinking cities in more developed nations. In developing cities, urbanization and the rapid influx of rural migrants often occur without benefit of government planning, infrastructure and services. Many cities have started to move towards becoming eco-cities, cities where inhabitants not only realize the importance of reducing their ecological footprint, but also of improving their urban forests. This has resulted in communities creating policies to protect, conserve and manage their urban forests to optimize ecosystem services, materials, and social benefits and in so doing also reduce the rate at which planetary wide global warming occurs. Despite the relevance of the campus trees in academic environment, few studies have been conducted on the perceptions of campus occupants and the management strategies for campus trees in academic environments. Such study will assist in the formulation of appropriate management options for trees in academic environment. This study therefore assesses the significance and the preferences for campus trees to the campus occupants and management strategies for trees on the University of Ibadan, Nigeria.

## MATERIALS AND METHODS
### Study Area
University of Ibadan campus is located in Ibadan, Oyo State, Nigeria. This is the premier university in the country and has a long history of campus trees. The university was formerly known as the University College, Ibadan, and was founded in 1948. At first, it occupied the old site previously used by the 56th Military General Hospital about eight kilometers away from the new or permanent site. The new site covers over 1,032 hectares of land generously leased by the chiefs and people of Ibadan for 999 years (Ibadan, 2002). The university runs courses in the Faculties of Arts, Agriculture and Forestry, Education, Social Sciences, Law, Veterinary Medicine, Sciences, Medicines, and Pharmacy.

The history of establishment of campus trees on the campus is as old as the university. Tree planting commenced not long after the permanent site was established. In addition, many of the tropical trees that were at the site were spared as patches of forests and along the road, some of these trees still exist as at the time this study was conducted (Fig. 1). In addition, the authorities of the institution also embarked on tree planting to increase the density of trees on the campus as well as improving the aesthetic value of the institution. The Campus Tree Management Committee (CTMC) is the only body that is set up by the University of Ibadan Senate Council to manage trees on the campus. The main objective of the committee is to manage trees on the campus as well as protect life and property from tree damage. There is a misconception that the major activity of the committee is to fell trees on the campus, but the committee also engages in tree planting, landscaping, and protection of life and property from tree damage.

### Sampling technique and sample population
The study was conducted between March and May, 2008. Trees along the major roads and around offices, Faculties and Halls of Residence and staff quarters were sampled and identified through the assistance of a tree identifier. Then using a simple random sampling technique, three categories of respondents were surveyed, composed of the teaching staff, non-teaching staff, and the undergraduate and postgraduate students. The teaching and non-teaching staffs were randomly selected across all the Faculties

while the students were sampled in both the Faculties and Halls of Residence. Structured questionnaires were used for data collection and personally administered to the respondents through random selection. The questionnaires were administered to fifty subjects in each of the groups making a total of 150 subjects. This amounted to a sampling intensity of about 0.1% of the university total population. Of these, 120 questionnaires (80% response rate) were retrieved in the order of 45 for students (90%

response rate), 40 for teaching staff (80% response rate), and 35 for non-teaching staff (70% response rate). In addition to the information obtained through the questionnaires, a personal interview was undertaken with the Technical Officer of Campus Tree Management Committee (CTMC) at the Department of Forest Resources Management with the intention to obtain detailed information on their daily operations and tree management activities.



**Figure. 1: Aerial view of University of Ibadan, Nigeria with dark patches of street trees (Google earth, 2009)**

### RESULT
**Trees on the campus of University of Ibadan**
On the campus of the University of Ibadan, trees are located around the faculties, offices, roads, halls of Residence and staff residential areas (Fig. 2). The trees include both indigenous and exotic species. Table 1 presents some of the identified trees on the University of Ibadan campus and their major utilisation.

**Figure 2: Street trees along the main road leading into the campus of University of Ibadan, Nigeria**

**Table 1. Some of the identified trees on the University of Ibadan Campus**

| Scientific name | Family | Common name | Major function(s) on campus |
|---|---|---|---|
| *Artocarpus artilis* | Moraceae | Breadfruit | A, B, D |
| *Azadirachta indica* | Meliaceae | Neem | A, B, F |
| *Carica papaya* | Caricaceae | Pawpaw | D |
| *Citrus sinensis* | Rutaceae | Orange | D |
| *Cocos nucifera* | Arecaceae | Coconut tree | D, B |
| *Cola nitida* | Sterculiaceae | Kola | A |
| *Delonix regia* | Fabaceae | Flambouyant tree | A, B, F |
| *Elaeis guineensis* | Arecaceae | Palm tree | D |
| *Eucalyptus* spp. | Myrtaceae | Eucalyptus | A, B |
| *Ficus* spp. | Moraceae | Ficus | A, E |
| *Gliricidia sepium* | Fabaceae | | A |
| *Gmelina arborea* | Verbenaceae | Parrot's beak | A, F |
| *Hura crepitans* | Euphorbiaceae | | A |
| *Mangifera indica* | Anarcardiaceae | Mango tree | A, D, B |
| *Milicia regia* | Moraceae | Iroko tree | A, C |
| *Milicia excels* | Moraceae | Iroko tree | A, C |
| *Newbouldia laevis* | Bignoniaceae | Tree of life | E |
| *Parkia biglobosa* | Fabaceae | Locust beans | A, B, D |
| *Pinus* spp. | Pinaceae | Pine | B |
| *Psidium guajava* | Myrtaceae | Guava | D, E |
| *Roystonia regia* | Arecaceae | Royal palm | B |
| *Samanea saman* | Fabaceae | Samanea | A, C |
| *Senna fistula* | Caesalpinoideae | Gum arabic | A |
| *Spathodea campanulata* | Bignoniaceae | African tulip | E |
| *Sterculia trigacantha* | Sterculiaceae | Chestnut | C |
| *Tectona grandis* | Verbenaceae | Teak | A, F |
| *Terminalia catappa* | Combretaceae | Almond tree | A |
| *Terminalia ivorensis* | Combretaceae | Black afara | C |

(A) Shade (B) Aesthetic (C) Protection (D) Fresh edible fruits (E) Medicinal value (F) Firewood

**Demographic characteristics of respondents**

The demographic characteristics of the respondents are presented in Table 2. More than half of the respondents were female, the ages of the respondents were between 20 and 50 years, and more than half of the respondents were married. Many of the respondents attended secondary school as the highest level of education.

**Table 2: Demographic characteristics of the respondents**

| Demographic characteristics | Teaching staff | | Non-teaching staff | | Students | | Combined data | |
|---|---|---|---|---|---|---|---|---|
| | Freq. n=40 | % | Freq. n=35 | % | Freq. n=45 | % | Freq. n=120 | % |
| Gender | | | | | | | | |
| - Male | 22 | 55.0 | 15 | 42.9 | 22 | 48.9 | 59 | 49.2 |
| - Female | 18 | 45.0 | 20 | 57.1 | 23 | 51.1 | 61 | 50.8 |
| Age distribution (years) | | | | | | | | |
| 20-30 | 2 | 5.0 | 5 | 14.3 | 25 | 55.6 | 32 | 26.7 |
| 31-40 | 19 | 47.5 | 10 | 28.6 | 16 | 35.5 | 45 | 37.5 |
| 41-50 | 11 | 27.5 | 13 | 37.1 | 4 | 8.9 | 28 | 23.3 |
| 51-60 | 5 | 12.5 | 5 | 14.3 | 0 | 0 | 10 | 8.3 |
| >61 | 3 | 7.5 | 2 | 5.7 | 0 | 0 | 5 | 4.2 |
| Marital status | | | | | | | | |
| - Single | 6 | 15.0 | 10 | 28.6 | 38 | 84.4 | 54 | 45 |
| - Married | 34 | 85.0 | 25 | 71.4 | 7 | 15.6 | 66 | 55 |
| Highest Education | | | | | | | | |
| - Primary | 0 | 0 | 2 | 5.7 | 0 | 0 | 2 | 1.7 |
| - Secondary | 0 | 0 | 16 | 45.7 | 22 | 48.9 | 38 | 31.7 |
| - National Diploma | 0 | 0 | 10 | 28.6 | 5 | 11.1 | 15 | 12.5 |
| - B.Sc./B.Ed. | 0 | 0 | 5 | 14.3 | 11 | 24.4 | 16 | 13.3 |
| - M.Sc./M.Ed. | 12 | 30.0 | 2 | 5.7 | 7 | 15.6 | 21 | 17.5 |
| - Ph.D. | 28 | 70.0 | 0 | 0 | 0 | 0 | 28 | 23.3 |

**Preferences and willingness to plant and protect trees by the campus occupants**

Many of the sampled respondents on the campus indicated that they have trees around their buildings, offices and other places of work, and have preferences for certain types of trees. A majority of the respondents also indicated that they did not personally plant the trees, and that they like trees and will protect the trees around their buildings and in their environment (Table 3). Shade producing trees ranked the highest among the preferred trees for teaching staffs and students while many of the non-teaching staffs preferred fruit producing trees. When further asked if they are ready to plant seedlings of their preferred trees in their surroundings, a majority of the respondents indicated positive although with a considerable percentage not yet ready to plant trees (Table 3).

**Significance of trees on campus**

All the respondents identified significance of tress on campus ranging from positive contributions to side effects. Provision of shade from sunlight and cool environment ranked highest among the significance of the trees (Table 4). Despite a number of advantages of the trees mentioned, some negative side effects of the trees were also identified by the respondents. Ranking first among the mentioned disadvantages of trees was danger the trees could cause to life and property if not properly managed.

**Table 3: Preferences and willingness to protect trees by campus occupants**

| Demographic characteristics | Teaching staff | | Non-teaching staff | | Students | | Combine data | |
|---|---|---|---|---|---|---|---|---|
| | Freq. n=40 | % | Freq. n=35 | % | Freq. n=45 | % | Freq. n=120 | % |
| Do you have preference for trees? | | | | | | | | |
| • Yes | 35 | 87.5 | 33 | 94.3 | 25 | 55.6 | 93 | 77.5 |
| • No | 5 | 12.5 | 2 | 5.7 | 20 | 44.4 | 27 | 22.5 |
| What type of trees do you prefer? | | | | | | | | |
| • Shade producing trees | 20 | 50 | 10 | 28.6 | 20 | 44.4 | 50 | 41.7 |
| • Fruit producing trees | 10 | 25 | 20 | 57.1 | 10 | 22.2 | 40 | 33.3 |
| • Aesthetic trees | 8 | 20 | 0 | 0 | 12 | 26.7 | 20 | 16.7 |
| • Any tree | 2 | 5 | 5 | 14.3 | 3 | 6.7 | 10 | 8.3 |
| Are you ready to plant trees in your surrounding? | | | | | | | | |
| • Yes | 35 | 87.5 | 20 | 57.1 | 30 | 66.7 | 85 | 70.8 |
| • No | 5 | 12.5 | 15 | 42.9 | 15 | 33.3 | 35 | 29.2 |

**Table 4: Significance of trees to the respondents**

| Variables | Freq n=120 | Percentage (%) |
|---|---|---|
| **Significance of trees** | | |
| • Shade from sunlight and cool environment | 26 | 21.7 |
| • Beauty to the surrounding and environment | 20 | 16.7 |
| • Protection of building from strong winds | 15 | 12.5 |
| • Shade for trade and motor park | 13 | 10.8 |
| • Fresh edible fruits | 12 | 10.0 |
| • Medicinal value | 10 | 8.3 |
| • Firewood | 8 | 6.7 |
| • Protection of soil and environment from erosion | 7 | 5.8 |
| • Watershed | 4 | 3.3 |
| • Relaxation | 3 | 2.5 |
| • Display of banners and posters | 2 | 1.7 |
| **Disadvantages of trees** | | |
| • Danger to life and property | 40 | 33.3 |
| • Fallen leaves dirty environment | 32 | 26.7 |
| • Harbour dangerous animals and pests | 28 | 23.3 |
| • Roots damage roads | 12 | 10.0 |
| • Obstruction if fallen and not removed | 8 | 6.7 |

**Views of respondents on campus tree management**

As indicated in Table 5, many of the respondents disagreed that there is effective tree management on the campus of University of Ibadan. The teaching staff are aware of the presence of the Campus Tree Management Committee (CTMC), which is the only committee approved by the Senate of the institution and given the mandate to manage trees on the campus. On the other hand, about 85% of the non-teaching staff and 87% of the students are not aware of the presence of the CTMC. Out of those that are aware of the existence of CTMC, many got to know them by seeing them during their operations on campus. Furthermore, the majority of the respondents did not know the procedure to follow in getting the necessary assistance from CTMC and also disagreed that the operations of the committee were effective.

Of the complaints that the respondents have on the operations and management of campus trees (Table 5), delay in response to distress calls ranked the highest for both teaching and non-teaching staffs with 45% and 37.1%

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respectively, while the high noise that emanates from the use of the power chain saw (44.4%) ranked the highest for the students. Other complaints mentioned by the respondents include delay or nonremoval of fallen trees on time, and inadequate manpower.

**Table 5: Perception of campus occupants on the management status of trees**

| Variables | Teaching staff | | Non-teaching staff | | Students | |
|---|---|---|---|---|---|---|
| | Freq. n=40 | % | Freq. n=35 | % | Freq. n=45 | % |
| Is there effective management of trees on campus? | | | | | | |
| • Yes | 5 | 12.5 | 7 | 20 | 5 | 12.5 |
| • No | 35 | 87.5 | 28 | 80 | 40 | 87.5 |
| Are you aware of the presence of Campus Tree Management Committee (CTMC)? | | | | | | |
| • Yes | 25 | 62.5 | 5 | 14.3 | 5 | 12.5 |
| • No | 15 | 37.5 | 30 | 85.7 | 40 | 87.5 |
| Do you know the procedures to follow in getting CTMC's assistance? | | | | | | |
| • Yes | 25 | 62.5 | 10 | 28.6 | 5 | 12.5 |
| • No | 15 | 37.5 | 25 | 71.4 | 40 | 87.5 |
| Is the operation of CTMC effective? | | | | | | |
| • Yes | 10 | 25 | 15 | 42.9 | 5 | 12.5 |
| • No | 30 | 75 | 20 | 57.1 | 40 | 87.5 |
| Kindly mention your complain about the operations and management of campus trees | | | | | | |
| • Noise of the chain saw | 10 | 25 | 5 | 14.3 | 20 | 44.4 |
| • Delay in response to distress call | 18 | 45 | 13 | 37.1 | 5 | 11.1 |
| • Delay or not removal of fallen trees | 7 | 17.5 | 7 | 20.0 | 12 | 26.7 |
| • Inadequate manpower | 5 | 12.5 | 10 | 28.6 | 8 | 17.8 |

**DISCUSSION**

The major functions performed by identified trees on the campus include provision of shade, aesthetic and other beautification functions, protection of buildings from strong wind and erosion, production of fresh edible fruits, utilisation of the parts as medicine, and utilisation of dead and fallen branches as firewood. In developed countries, a prime focus in the past was management of the urban forest for aesthetic purposes, whereas now, as urban populations have grown, intensified, and expanded, it has shifted to management for enhancing ecosystem services (Nowak, 2000). In developing countries, a more important focus may be managing vegetation to provide materials, such as firewood, fruit and timber, at very local scales (Carter, 1995). Over time, each city and region may manage its urban forest for an increasingly broader and more inclusive range of benefits. Hence, in defining the bounds of urban forestry as a discipline, it is important to consider the current developmental needs of a population as they establish urban forestry goals most suited to their city's social, economic and geographic context. It may not be as important to rigorously define which vegetative elements are to be considered part of the urban forest as much as to identify the diverse contributions and functions of vegetation and unpaved soils, both within and outside the city, to a particular community's well-being.

The occupants on the campus of University of Ibadan do not just want trees of any kind in their environment, but have specific preferences for the trees. A study by Ajayi and Babalola (2006) on the two public nurseries producing tree seedlings for commercial purpose in Ibadan revealed that many of the people that patronise the nurseries have preferences for plant with aesthetic value and those with edible fruits. In another study. Babalola (2008) discovered that the types of customers who patronized the nursery establishments in Ibadan cut across all categories of classes in the community but the overriding factors that determine customers' patronage are the economic status, financial returns from trees, interest in having ornamental plants around buildings, awareness on the environmental

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benefits derived from having avenue plants, and appreciation of the aesthetic value of the ornamental seedlings. This would suggest that before any sustainable planting programme is carried out in residential areas on campus, it is therefore advisable that peoples' opinions be sought to know their preference and acceptance of such trees. Although shade producing trees may be planted in public areas like along roads and motor parks, in residential areas there is need for a survey on the preferences necessary for acceptance of such trees.

Basically, there are two categories of people on the campus of University of Ibadan with different perceptions of trees. There are those that love having trees around their building and as campus plants, and this category of people appreciates trees wherever they are even if the trees pose danger to life or property. On the other hand, there are also those with negative perceptions of trees. These people develop dislike for trees and always see reasons why trees should be removed from any location. Despite the above, the second categories of people who do not like trees are few in number. Many of the campus occupants indicated their willingness to protect the trees around their buildings due to the long run benefits and expressed a deep attachment to the trees. Planting of vegetation by people in urban areas is gaining more attention and increasingly utilised as an effective means of reducing air pollution in addition to other benefits (Grey and Deneke, 1992; Palijon, 2004). This has been an objective of urban forestry projects in Kuala Lumpur (Malaysia) and Manila (Philippines) (Kuchelmeister, 1998). Other related studies have shown willingness to take environmental action as one surrogate for place attachment and environmental stewardship (Ryan, 2005).

In addition to adding beauty to the campus environment, trees also provide shade for vehicles and small businesses. Traders site their businesses under the trees like neem (*Azadirachta indica*), flambouyant (*Delonix regia*), and gmelina (*Gmelina arborea*). Provision of fresh fruits is a another vital contribution of trees on the campus by contributing to the nutritional value of the residents as well as income to some who engage in selling of the fruits. In addition to having aesthetic value, almost all the identified trees have medicinal value. Tree parts ranging from leaves, bark, and root are harvested for treatment of various ailments and sicknesses. It is a common phenomenon to see different sizes of posters and banners pasted on trees on the campus, thereby serving another unique function of a medium for advertisement. Also the microclimatic condition provided by trees on the campus of University of Ibadan provides fresh and cool environment for all and sundry.

Firewood is an important tree product in developing countries (Knuth, 2005). The urbanisation process has important implications for household energy consumption patterns in general and wood energy use in particular. Population growth does not only imply increased wood energy consumption but also increased pressure on the availability of fuelwood in areas where fuelwood supply is not abundant (Knuth, 2005). The contribution of Ibadan campus trees to domestic energy generation on campus in the form of firewood cannot be undervalued. The firewood use is not limited only to the low income people but is utilised by all the cadres of residents on campus and most especially during cooking for celebrations.

Vegetation management in urban areas contribute significantly to the total plant diversity found throughout human settlements (Nillsson, *et al.*, 2000). The vertical complexity, species composition, health and distribution patterns of this green urban mosaic will then reflect the variation in ownership patterns, professional training, aesthetic sensibilities and choices, perceived value of vegetation, funding levels, and education of these diverse managers (Carreiro and Zipperer, 2008). Understanding how such diversity affects the ecological functioning of the landscape as a whole remains an important challenge for urban ecologists and practitioners wishing to promote and distribute particular ecological functions at a citywide scale, while enhancing community well-being at the local level (Carreiro and Zipperer, 2008). Many of the tropical forests which were initially spared on the Ibadan campus have been encroached upon by buildings, sport facilities and farmlands. In addition, many of the trees which were legally felled on the campus were not replanted and this is currently leading to drastic reduction in the campus trees. It is unfortunate to note that provisions for replanting felled trees as well as penalties for illegal felling of trees on the campus are not properly documented. When these provisions are eventually in place, another issue of appropriate implementation and follow-up will definitely arise, since many of the respondents indicated that they are not aware of the existence of CTMC and do not know the procedures to follow in getting their assistance.

Among the complaints of the campus occupants on the management activities of the CTMC, delay in response to distress calls ranked the highest for both teaching and non-teaching staff due to the fact that these categories of occupants are more directly affected by trees than the students. Management activities of CTMC affected students more by the the high noise that emanates from the use of the power chain saw. Meanwhile, all the respondents are affected by the delay in removal or non-removal of fallen trees that cause obstruction to vehicles and human movement. The CTMC team is faced with a number of challenges that are hindering effectiveness of their operations. If these challenges are adequately resolved and activities well organised, their operations will

definitely be improved with effective management activities. Among the challenges facing the CTMC that needed urgent attention includes obsolete equipment; Shortage of manpower: insufficient funding, and lack of on-the-job-training for the gang members of the gang. The operation of the University of Ibadan CTMC can be compared to what is in place at the University of Arizona (UA) campus. The UA Campus Arboretum Committee is committed to preserving the University's unique trees and shrubs for their educational, historic, economical and aesthetic value. As a part of the larger Tucson urban forest, the campus trees are a resource for both the campus community and the University's neighbors and visitors. Campus tree managers are in agreement with the general concepts put forth by the Campus Comprehensive Plan that advocate for more shade, more attractive open spaces, and more use of outdoor areas (Davison, 2002).

Effective management and planning of urban forests for promoting ecological and social benefits depends on obtaining information and creating databases on the abundance and distribution of vegetation across the city in relation to such variables as social context and land use, both current and planned (Carreiro and Zipperer, 2008). In some cases, the primary focus may be to improve ecosystem services and biodiversity conservation at the city scale (Löfvenhaft *et al.*, 2002). In others, urban forest management may be more focused on providing tangible commodities for residents, such as food or fuel (Carter, 1995). Through the use of geographic information systems (GIS), spatial overlays of current and planned development or management together with environmental maps can identify locations for new plantings that enhance social and ecological benefits, and to assess policy efficacy and inform adaptive management decision-making for the future (e.g., Dwyer *et al.*, 2000). Inventories can simply be lists of trees by species and their locations, or contain detailed information such as tree size, vertical structure and health in relation to site conditions, land use, distribution of canopy cover and vegetation, and cultural importance. Such inventories should also be updated regularly so they can be used to determine change in characteristics important to management, such as mortality and growth rates of trees, changes in species composition, and distribution of canopy cover in private and public sectors (Nowak et al., 2004).

## CONCLUSIONS AND RECOMMENDATIONS

This study has shown that both residents, students, faculty and staff alike have a strong attachment and appreciation of trees on the campus. This is an important finding in that it validates previous research in a new cultural setting. Furthermore, this study also showed the unique ways that campus trees are valued for a variety of uses including medicine, food, fuel, beauty and shade. These findings broaden our understanding of the sustainable aspects of campus trees beyond the traditional uses described in many North American and European settings (ie., shade, beauty).

The fact that this is a university campus suggests that these study results may not apply to the general public. A follow-up study in places outside the academic environment is therefore recommended. For effective and sustainable management of trees on the campus, there is need for the following:

1. Frequent inventory and survey of trees on campus to note distribution and density as well as structural and physical changes necessary for management practices. This will also enable the concerned tree management authority to note and mark weak trees on time before they cause damage to property or take life. Weak trees that pose danger to life and property should be removed and replaced with two or more seedlings of other trees.

2. Put in place appropriate manpower on the tree management team so as to meet the challenges of distress calls and other tree management operations like removal of fallen and weak trees. Furthermore, there is need for procurement of modern chain saws and other required equipment, and provision for on-the-job-training for the members of the gang to update them on the current techniques of managing trees.

3. Survey the tree preferences by the campus occupants when planning for a tree planting programme. This is most important in residential areas where the fate for the survival of the trees will be determined by the people living close to them.

4. Ultimately, the university administration should budget and make available funds to aid effective operations of the tree management committee.

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