



Public Perception of Urban Forest in Selected Research Institutes within Ibadan Metropolis and Its Implications on Environmental Conservation

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ABSTRACT

Urban forest is increasingly coming under serious pressure from growing population and subsequently their various socio- economic demands. This is characterized with great impacts on environmental conservation. This study therefore assessed the perception of staff on urban trees in selected Research Institutes in Ibadan metropolis and its implications on environmental conservation. A proportionate sampling technique was used to select 5% respondents in NACGRAB and NISER while 10% was used in FRIN, NIHORT and IAR&T. A total number of One hundred and sixty eight (168) respondents were selected for questionnaire administration. Descriptive and Inferential statistics were used to analyze the data. A total of sixty six (66) trees species were identified with *Azadirachta indica* and *Terminalia randii* having highest frequency of 5. Combretaceae and Meliaceae were the common families in the sampled institutes out of the twenty two (22) families identified. 94% of the respondents have preference for trees and 81.5% of them were willing to participate in a project to plant trees. Most of the respondents (90%) planted trees around their houses for purpose of providing fruits, while 86.9% indicated for the beautification of environment. Climatic amelioration in conservational implications ranked first with highest percentage of 91% while 64.3% of the respondents believed more on merits of trees than demerits. Planting of trees should be encouraged in order to purify the atmospheric air, control erosion, reduce wind speed and enhance amelioration of climate change.

Keywords: Environmental Conservation, Climatic amelioration, Preservation

Introduction

Forest is a complex ecosystem consisting mainly of trees that buffer the earth and support a myriad of life forms. Forest consist not only of living (biotic) components like trees, animals, plants and other living things but also of nonliving

(abiotic) components such as soil, water, air and landforms (Babalola, 2010).

Urban forests are ecosystems characterized by the presence of trees and other vegetation in association with human developments (Nowak *et al*, 2001). Increasing urbanization and development have placed urban forests under extreme



pressure, threatening their ability to maintain the basic ecological functions, including water and air purification, upon which human existence depends (U.S. Department of Agriculture, Forest Service. 1996). Community involvement is critical for the continued vitality of the urban forest (Dwyer *et al*, 2002). To encourage and ensure this involvement, it is important to understand the public's shared beliefs and attitudes toward trees that promote their care, management, and protection. According to (Ajewole, 2005), the urban environment is generally characterized by impervious surfaces, highly reflective and radiating materials like concrete, and metals. These are in addition to the presence of economic activities, such as heating, cooking, and transportation. All of these have inherent capacities to produce immense heat, smoke, and dust, which severally and collectively degrade the urban environment.

Trees absorb carbon dioxide as they grow and the carbon that they store in their wood helps slow the rate of global warming. It also prevents flooding, soil erosion and absorbing thousands of liters of storm water. They create an ecosystem to provide habitat and food for birds and other animals. It absorbs carbon dioxide and potentially harmful gases, such as sulfur dioxide, carbon monoxide from the air and release oxygen. One large tree can supply a day supply of oxygen for four people (Wilson, 2011).

Urban forestry a major component of management of trees outside forests offers a variety of benefits capable of mitigating these problems. These benefits include; providing the urban dwellers, (especially the urban poor) with some essential forest produce, mitigation of the ecological effects of urban sprawl, improving the living environment in urban areas, attraction of tourism, provision of avenue for recreation and solitude fort activities, encouragement of investment, as well as creation training and employment opportunities (Xie 1998)

Planning and management efforts have not been as effective as they might have been because planners and managers have underestimated the potential benefits that urban trees and forests, and have not understood the planning and management efforts needed to provide those benefits, particularly the linkages between benefits and characteristics of the urban forest and its management. For effective management of trees, it is therefore essential to have basic data on tree species composition and perception of people directly interacting with such trees.

The above information needs to examine people's perception of urban trees and environmental conservation in selected Research Institutes within Ibadan metropolis.

Materials and Method

The study areas are located within Ibadan Metropolis (Fig.1). Ibadan is divided into urban area (metropolis) and Peri urban



area. It is situated in the South Eastern part of Oyo State; Ibadan metropolis located on latitude $7^{\circ} 20' 03''$ and Longitude $7^{\circ} 26' 12''$ N, and Longitudes $3^{\circ} 51' 65''$ and $3^{\circ} 56' 48''$ E. (Ariwado *et al.*, 2012). Ibadan consists of eight (8) research institutes. Three (3) are within the Peri-urban while five (5) are in the metropolis (Popoola, 2001). The research institute within the metropolis are;

1. NIHORT: National Horticultural Research Institute
2. IAR&T: Institute of Agricultural Research and Training (IAR&T)
3. NACGRAB: National Center for Genetic Resource and Biotechnology
4. FRIN: Forestry Research Institute of Nigeria
5. NISER: Nigeria Institute of Social and Economic Research

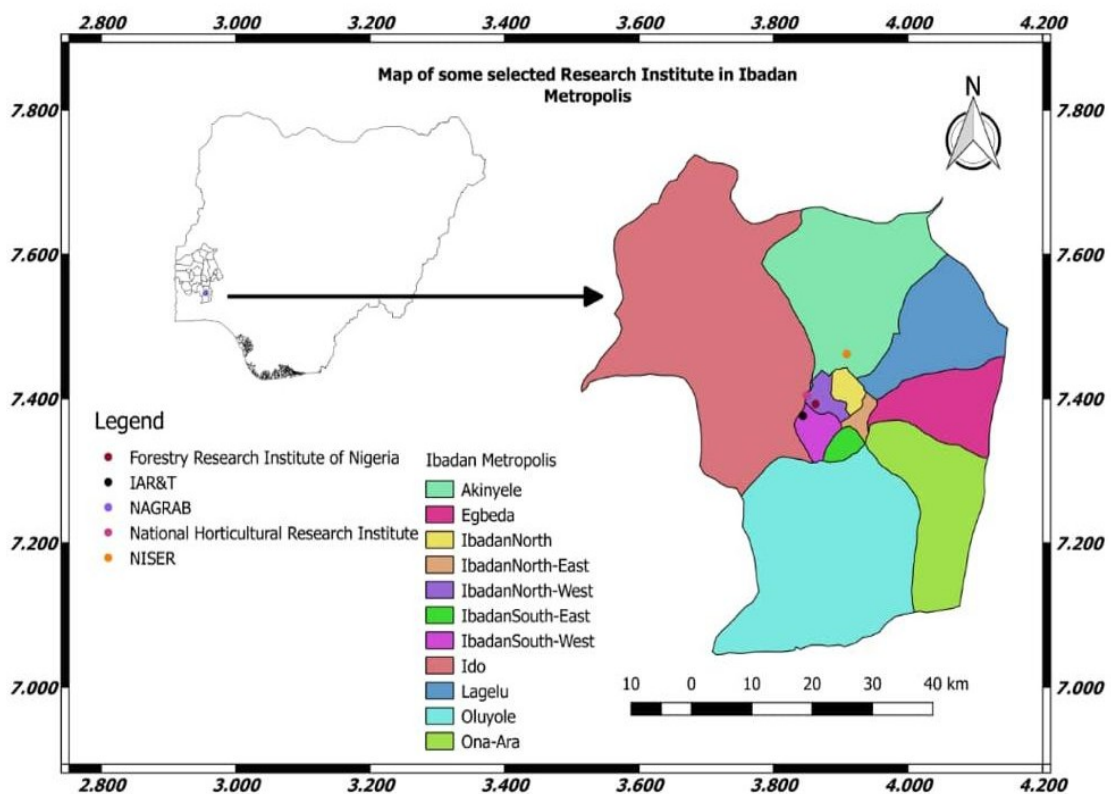


Figure 1: map showing the study area which all the Research Institutes were located and the local government each is located.



Data Collection

Data was collected via secondary and primary sources. The secondary sources was from text books, journal and internet sources. The primary source was through the use of structured questionnaire. The proportionate sampling technique was used to select respondents in the selected institutes. The number of questionnaires used was derived using the formula proposed by Diaw *et al.*, (2002). A sampling intensity of 5% was used to administer questionnaire in NACGRAB

and NISER While 10% sampling intensity was used for FRIN, NIHORT and IAR&T. The different sampling intensity used was due to the population of staff in the various research institute., therefore a total of One hundred and sixty eight (168) questionnaires were administered in the different research institutes according to Table.1

Descriptive statistics (percentages and frequency distribution) and inferential statistics were used to analyze the data collected.

Table 1: showing the staff strength of each research institute.

s/no	Research Institutes	Staff Strength	No of Respondent
1.	NACGRAB	97	10
2.	NISER	316	32
3.	FRIN	744	37
4.	NIHORT	817	41
5.	IAR&T	900	48

Results and Discussion

Socio-demographic characteristics of the respondents

Table 2 below reveals the socio-demographic characteristics of the respondents in the study area. The majority of the respondents were in age group between 31-40 years (41.7 %), followed by 41-50 years (35.1 %), and 51-60 years (11.9%) then the older, whose age were above 61years -above (1.8%). 53.0% of the respondents were female, while 47 % were male indicating a slightly higher percentage of female to that of male respondents. This is contrary with findings of Etim *et al.* (2012) who

found that majority of respondents who were actively involved in urban tree planting were males and in their active age. Majority of the respondents (74.4%) were married indicating that respondents in the study area have more responsibility coupled with one saddle them in the office. While 14.9%, 8.3% and 2.4% were single, divorced and widow/widower respectively.

Respondents in the Research Institutes were well educated 63.7% of them had a post-secondary school education. This might be National Diploma, Higher Diploma, College/ University graduate (undergraduate and postgraduate) and professional qualification while some of



the respondents were opportune to attend only primary (12.5%) and secondary school (23.8%). This is supported by the findings of Etim *et al.* (2012) in Awareness and perception of urban forestry among dweller in Sahel Savanna Region of Nigeria, Ajewole, (2005) stated that majority of the respondents have attained tertiary education representing 78.3%. Ajewole, (2005) and Faleyimu, (2014) asserted that formal education has advantages over the deficiency in non-formal education and could positively influence the adoption of innovation. This implies that level of education of the respondents will enhance their effective participation in the development of Research Institutes. Moreover, majority of the respondent

were non-academic staff with 54.2% responses while only 45.8% were academic staff. This tells more that respondent with high percentage of responses understood and have perception about urban trees in their immediate surrounding/offices.

Majority of the respondents who have worked for more than five (5) years had 58.9%, those between 2 years to 5 year of service were 28.0% while the minimum percentage (13.1%) was recorded on those who had less than 2 years of working experience. This shows that an average worker who responded is quite familiar with the environment of the institute thus providing valuable information regarding the subject matter.

Table 2: Demographic characteristics of Respondents

Demographic characteristics	Frequency	Percentage	Cumulative %
Age			
20-30	16	9.5	9.5
31-40	70	41.7	51.2
41-50	59	35.1	86.3
51-60	20	11.9	98.2
Above 61	3	1.8	100.0
Total	168	100.0	
Gender			
Male	79	47.0	47.0
Female	89	53.0	100.0
Total	168	100.0	
Marital Status			
Single	25	14.9	14.9
Married	125	74.4	89.3



Divorced	14	8.3	97.6
Widow/Widower	4	2.4	100.0
Total	168	100.0	
Educational Status			
Primary School	21	12.5	12.5
Secondary School	40	23.8	36.3
Post-Secondary School	107	63.7	100.0
Total	168	100.0	
Cadre			
Academic Staff	77	45.8	45.8
Non Academic Staff	91	54.2	100.0
Total	168	100.0	
Years of employment			
< 2	22	13.1	13.1
2-5	47	28.0	41.1
>5	99	58.9	100.0
Total	168	100.0	

Table 3 shows Tree Species Identified in the Research Institutes

Sixty-six (66) tree species were identified in the Institutes sampled belonging to twenty-two (22) different families. Among which are Arecaceae, Brassicaceae, Caesapiniaceae, Moracea, Papilionaceae. and so on. These families Combretacea, and Meliaceae occurred in the five Institutes sampled viz: FRIN, NISER, NIHORT, NAGRAB and IAR&T while Arecaceae (FRIN, NIHORT and IAR&T), Lauraceae (FRIN, NAGRAB and NIHORT), Fabaceae (NIHORT and IAR&T), Mimosaceae (FRIN and NIHORT). Examples of tree species

identified in immediate staff offices of the institute sampled were *Pterocarpus osun*, *Shorea roxburghii*, *Samanea saman*, *Terminalia mantaly*, *Terminalia radii*, *Terminalia catappa*, *Triplochiton scleroxylon*, *Vitex doniana*, *Xylia xylocarpa* among others.

However, the occurrence of different tree species indicates that the institutes are embodiment of nature thus adding more value to the environment. Bassett, (2015) also noted the benefits and values trees add to the environment in university campuses. This shows the importance of trees in academic environment.



Table 3: Species of Tree identified

S/NO	Species	Family	Frequency
1	<i>Acacia holosericea</i>	Mimosaceae	1
2	<i>Azalia africana</i>	Caesalpiniaceae	1
3	<i>Albizia lebeck</i>	Mimosaceae	2
4	<i>Anelsonia eurycarpa</i>	Brassicaceae	1
5	<i>Azadirachta indica</i>	Meliaceae	5
6	<i>Blighia sapida</i>	Sarpindaceae	1
7	<i>Cascabela thevetia</i>	Apocynaceae	1
8	<i>Cassia fistula</i>	Fabaceae	2
9	<i>Cedrela odorata</i>	Meliaceae	1
10	<i>Cocos nucifera</i>	Arecaceae	2
11	<i>Dacryodes edulis</i>	Burseraceae	1
12	<i>Deloni regina</i>	Caesalpiniaceae	1
13	<i>Entandrophragma angolense</i>	Meliaceae	1
14	<i>Entandrophragma cylindricum</i>	Meliaceae	3
15	<i>Eucalyptus camadulensis</i>	Myrtaceae	1
16	<i>Hildegardia barteri</i>	Sterculiaceae	1
17	<i>Holarrheria floribunda</i>	Apocynaceae	2
18	<i>Irvingia wombolu</i>	Irvingiaceae	2
19	<i>Khaya senegalensis</i>	Meliaceae	1
20	<i>Magnifier indica</i>	Combretaceae	2
21	<i>Melaleuca lencodendron</i>	Myrtaceae	1
22	<i>Morinda lucida</i>	Rubiaceae	1
23	<i>Nauclea diderrichii</i>	Rubiaceae	1
24	<i>Orania sylvicola</i>	Arecaceae	1
25	<i>Parkia biglobosa</i>	Mimosaceae	1
26	<i>Peltophorum pterocarpum</i>	Caesalpiniaceae	1
27	<i>Pericopsis elata</i>	Papilionaceae	3
28	<i>Persea Americana</i>	Lauraceae	2
29	<i>Polyalthia longifolia</i>	Annonaceae	1
30	<i>Pterocarpus osun</i>	Papilionaceae	1
31	<i>Queens palm</i>	Arecaceae	2
32	<i>Samanea saman</i>	Fabaceae	1
33	<i>Shorea roxburghii</i>	Dipterocarpaceae	1
34	<i>Tectona grandis</i>	Lamiaceae	1
35	<i>Terminalia catappa</i>	Combretaceae	4



36	<i>Terminalia mantaly</i>	Combretaceae	1
37	<i>Terminalia radii</i>	Combretaceae	5
38	<i>Tetrapleura tetraptera</i>	Mimosaceae	1
39	<i>Thevetia peruviana</i>	Apocynaceae	1
40	<i>Treculia africana</i>	Moraceae	1
41	<i>Triplochiton scleroxylon</i>	Mimosaceae	1
42	<i>Vitex doniana</i>	Vertenaceae	1
43	<i>Xylocarpus xylocarpa</i>	Mimosaceae	1
Total			66

Table 4 shows revealed that the entire respondent believed that tree provides means of revenue generation, control erosion/flooding, provide shade, for research purpose, provide medicinal plants, and provide recreational opportunities.

Tree growing in urban areas bestow a great variety of benefits. It is evident from the findings that urban forestry provides array of goods and services to the inhabitant and environment. This is in accordance with Faleyimu (2014) who states that water and wind erosion, flooding, high temperature, deforestation and desertification can be remedied by urban forestry. Other important benefits mentioned were, source for grazing for animal, source of beautification, and source for fruits. The perceptions of staff in Research Institute about tree indicates the fact that tree is a very important plant to have within and outside our domain to what it contribute to the environment. This is further supported by the report from Industry Standard Architecture,

(2011) which stated that trees brings natural elements and wildlife habitats into urban surroundings, all of which increase the quality of life for residents of the community and Clean Air Garden, (2012), also says Trees have aesthetic, environmental, human health, and economic benefits in urban ecosystems. Rega *et al.* (2015) also reported on the trees and your environment likewise the benefits of trees. Akabari, (2001) reported that trees have significant contributions to energy as well as control of heat in urban areas. This has been established by staff (respondents) of Research Institute about their perception of tree planted in their immediate office/environment.

Furthermore, urban trees have been reported to provide benefits such as contributions to aesthetic value (Schroeder, 1989). Also, Akabari, (2002) supported that the trees reduce energy consumption while Mcpherson, (1999) concluded that trees reduce need for air conditioning. The study by Kaplan (1989, 1993) on the role of nature in the context



of the workplace stated that trees around office environment provide psycho benefits and these influence job satisfaction, initiate more production.

Table: 4 Showing Respondent’s perception of trees in the Study area

S/No	Staff Perception	Yes	No
1	Is it a source of timber	137(81.5)	31(18.5)
2	Is it an habitat for wildlife	106(63.1)	62(36.9)
3	Is it a source of fire wood	126(75)	42(25)
4	Is it a source for grazing for animal	116(69)	52(31)
5	Is it a source of beautification	146(86.9)	22(13.1)
6	Is it a source for fruits	158(94)	10(6)
7	Is it revenue generation	168(100)	0(0)
8	Control erosion/flooding	168(100)	0(0)
9	Provide shade	168(100)	0(0)
10	Research purpose	168(100)	0(0)
11	Provision of medicinal plants	168(100)	0(0)
12	Provision of recreational opportunities	168(100)	0(0)

Table 5 showed the mean ranking of conservational implications of trees in the environment. Climate amelioration ranked first with the highest mean of 2.03. This is in support of Nowak *et al.* (1993) who stated that majority of respondent were aware that trees can mitigate climate change and remove air purification. This awareness may be attributed to public sensitization that trees can provide these environmental services.

This implies that trees are of importance in climate amelioration. Other conservational implications were

shelterbelt management with mean rank value of 2.01, desertification control (1.89), watershed management (1.89), and water erosion/flood control (1.68). Nowak *et al.*, (2008) stated that urban tree improve air quality, cool local air temperature, filter and retain storm water, sequester carbon, and contribute to healthier and more beautiful environment. McPherson *et al.*, (2003) noted that Existing trees are projected to reduce annual air conditioning energy use by 2.5%, while peak load reduction by existing trees saves utilities.

Table 5: Showing Mean ranking of conservational implications of trees in the environment;

S/No	Conservation	Agreed	Strongly	Undecided	Strongly	Mean(SD)	Rank
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implication		Agreed			Disagreed		
1	Water erosion/Flood control	74(44)	80(47.6)	11(6.5)	3(1.8)	1.68(0.05)	4th
2	Climate amelioration	41(24.4)	91(54.2)	26(15.5)	10(6)	2.03(0.06)	1st
3	Shelterbelt management	54(32.1)	69(41.1)	35(20.8)	10(6)	2.01(0.07)	2nd
4	Desertification control	53(31.5)	84(50)	28(16.7)	3(1.8)	1.89(0.06)	3rd
5	Watershed Management	54(32.1)	82(48.8)	29(17.3)	3(1.8)	1.89(0.06)	3rd

**Percentage in Parenthesis*

Conclusion and Recommendation

The result obtained from this study showed that staff of the Research Institutes are not ignorant of the trees around their immediate environment. Therefore, importance and knowledge of trees is high among members of staff as regards sustainability, ecology, climate change and economical uses. Also, the staff have different perceptions about trees around their immediate environment. The study showed the different ways that urban trees are valued for a variety of use including beautification of the environment, fuel and shade. Management is vital to keep trees in good and healthy status, as well as preventing them from constituting danger to lives and property. It is therefore recommended that planting of trees should be encouraged with proper management and conservation of the existing one. Also proper documentation of trees planted should be ensured at different Research Institute for Research and Educational purposes.

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