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POPULATION DENSITY AND VALUES OF AVENUE TREES: A CASE STUDY OF IBADAN METROPOLIS, OYO STATE, NIGERIA.

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ABSTRACT
The assessment of avenue trees was investigated in six selected areas including: Are, Rotimi Williams, Familusi, Awosika, Awolowo, Osuntokun within Ibadan metropolis where twenty respondents were selected in each of the avenues. Well-structured questionnaires were distributed among the respondents. The result showed that most of the respondents were male (90%) while (10%) were female was noted in Osuntokun Avenue. It was noted that Islam and Christianity were the major religion of the respondents. The highest respondents marital status was in Rotimi Williams avenue with (80%) married among others. 90% respondents with tertiary school education experience was found in Osuntokun avenue. However, the avenues with highest population of tree density (58 and 54) were found in both Awosika and Awolowo avenues respectively. Eighty seven (87) were total trees species planted in the selected areas (avenues) that serve as aesthetic value among others. Most respondents (81) reported that they maintained the avenues by pruning the trees among other methods of maintenance which serve as social benefits to them. There is urgent need to maintain ecological balance in terms of ameliorating the environment with tree planting strategies to enjoy its benefits to the fullness.

Keywords: Avenue trees, Values, Population Density, Ibadan metropolis

INTRODUCTION

The importance of forest to mankind cannot be overemphasized. Agbogidi and Eshegbeyi (2008) noted that forests and forest products play vital roles in human life from the cradle to the grave. Aimufia (2002) emphasized that the cot on which the baby lies at birth, the buildings and furniture he uses, at the various levels of his education, his endeavours in industry and agriculture, the accommodation and furniture he acquires as a worker/ entrepreneur, his diet and health sustaining systems, the armchair, he relaxes on his old age, and the coffin or casket in which he returns to mother earth are forest dependent. Keay *et al*., (1989); Adebisi *et al.,* (2002) stated that the traditional uses of forests are basically for subsistence, income, environmental, social and culture. Burkill (1999); Agbogidi and Eshegbeyi (2008) maintained that forests are often called the lungs of the earth for their role in the contribution to carbon sequestration and other global ecological service Udo (2001) noted that forest benefits include tangible benefits-wood products and non-wood products and environmental benefits. Etukudo (2000) emphasized that forests are man's divine treasure. Aliyu (2006) stated that reasonable numbers of medicinal species are threatened by habitat loss, following heightened deforestation (Agbogidi, 2002; Agbogidi and Ofuoku, 2006). In recent years social, economic and environmental considerations have led to a reevaluation of the factors that contribute to sustainable urban environments. Increasingly, urban green space is seen as an integral part of cities providing a range of services to both the people and other living things in the urban areas (James *et al.*, 2009). Although there is a great incompatibility between urbanizations and industrializations thus, agriculture and conservation developmental activities should be environmentally friendly to allow a sustained productivity (Agbogidi and Okonta, 2009). Avenue is a wide road often lined with trees especially one that leads to a large house (Oxford and Edmund, 1998). Generally, it means a row of trees planted along roads and paths. Avenue plantation is one of the important practices of growing trees along roadside and the canal side to increase aesthetic value and to provide shade to the stray animals and travelers during Emperor Ashoka as well as Akbar's rule. Besides, the National Forest Policy of 1988 emphasized in conducting research on social forestry aspects in India (Govinda and Moyiponger, 2015). The avenue trees play an important role in maintaining the ecological balance in an urban area. It also plays a major role reducing the pollution caused by vehicular movement and also reduces concentration of CO_2 in atmosphere. Some studies were conducted on the effect of vehicular pollution on avenue trees viz-a-viz:- *Azadirachta indica* and *Polyalthia longifolia*. Moreover, the avenue trees have been drastically affected due to modernization and developmental projects in the developing cities (James *et al*., 1991). Therefore, this study aimed at evaluating the importance of avenue trees in Ibadan metropolis, Southwestern

Nigeria to address this issue and form a base line for a scientific research study.

MATERIALS AND METHODS

Study area

The study area is Ibadan metropolis in Oyo State which is in South Western part of Nigeria. Ibadan lies on a coordinates of $7^0$24'7.0632" N and $3^0$55'2.3262"E. It has a total land area of 28,454 square Kilometres. It has a population of 1.4 million. The vegetation pattern of the State is that of rain forest in the South and guinea savanna in the North, (NGI, 2011).

Source: Google Earth (2020).

SAMPLING PROCEDURE

Twenty landlords were randomly selected from each avenue. The avenues were Are, Rotimi Williams, Familusi, Awosika, Awolowo and Osuntokun in Ibadan metropolis. The total of 120 structured questionnaires was administered in six avenues in Ibadan metropolis. Questionnaire administration and interview methods were used for data collection. Due to the literacy level of most of the landlords, the questionnaires were read and interpreted by them for adequate response.

DATA ANALYSIS

The data were analyzed using Statistical Package for Social Sciences (SPSS). Descriptive statistics was used to get frequency distribution tables and percentages to determine the proportions of the variables.

RESULTS AND DISCUSSION

Table 1: Gender distribution at the study area.

S/N	Avenues	Male%	Female%	Total (%)
1	Are	75	25	100
2	Rotimi Williams	70	30	100
3	Familusi	85	15	100
4	Awosika	85	15	100
5	Awolowo	80	20	100
6	Osuntokun	90	10	100

Table 2: Religion of the respondents

S/N	Avenues	Islam	Christianity	Traditional	Total (%)
1	Are	40	55	05	100
2	Rotimi Williams	40	60	-	100
3	Familusi	60	35	05	100
4	Awosika	55	40	05	100
5	Awolowo	45	50	05	100
6	Osuntokun	40	60	-	100

Table 3: Marital status of the respondent (%)

Avenue	Single	Married	Divorced	Widow/Widower	Total (%)
Are	5	65	20	10	100
Rotimi Williams	0	80	5	15	100
Familusi	5	70	15	10	100
Awosika	5	75	15	5	100
Awolowo	10	60	15	15	100
Osuntokun	10	55	20	15	100

Table 4: Educational distribution of the respondent (%)

Avenue	Primary	Secondary	Tertiary	Others	Total (%)
Are	-	15	75	10	100
Rotimi Williams	10	5	70	15	100
Familusi	20	15	60	5	100
Awosika	5	10	85	0	100
Awolowo	5	10	80	5	100
Osuntokun	5	5	90	0	100

Table 5: Respondents age distribution (%)

Avenue	≤ 20	21-30	31-40	41-50	51-60	>60
Are	-	05	10	45	25	15
Rotimi Williams	-	-	10	25	55	10
Familusi	-	10	05	60	20	05
Awosika	-	05	20	50	20	05
Awolowo	-	-	05	55	25	15
Osuntokun	-	-	20	15	60	05

Table 6: Sample population of Landlords in selected Avenues

Avenues	Number of respondents	Male	%	Female	%
Are	20	18	90	02	10
Rotimi Williams	20	19	95	01	05
Familusi	20	15	75	05	25
Awosika	20	20	100	00	00
Awolowo	20	14	70	06	30
Osuntokun	20	17	85	03	15

Table 7: Population density of trees from various Avenues

Name of Trees/Avenues	Are	Rotimi Williams	Familusi	Awosika	Awolowo	Osuntokun
Azadirachta indica			6			3
Newbouldia leaevis			2			
Polyalthia longifolia		10	15	27	21	16
Termilania catapa			2	2	1	11
Termilania mentalis				4	5	6
Ficus spp				1	5	
Mangifera indica	1			2		3
Dypsis lutescens				18		
Acacia spp		2		4		
Cycas revolute					2	
Elaeis guineensis					2	
Thuja plicata					10	
Pinus caribea	1	6			8	3
Citrus spp	3					
Total	**5**	**18**	**25**	**58**	**54**	**42**

Source: Salami and Akinyele (2016)

Table 8: Values of avenue trees by the respondents

Avenues/Values	Aesthetic	Shading	Erosion Control	Parking Space	Wind Breaker
Are	5	10			
Familusi	14	4	1	1	
Awosika	13	6			1
Awolowo	20				
Osuntokun	15	4	1		
Rotimi Williams	20				
Total	**87**	**24**	**2**	**1**	**1**

Source: Salami and Akinyele (2016)

Table 9: Showing maintenance of avenue trees by the respondents

Maintenance	Prunning	Trimming	Watering	Manuring
Avenues				
Are	3	7	1	
Rotimi Williams	16	5	10	4
Familusi	5	10		
Awolowo	20	20		
Awosika	20	18	12	13
Osuntokun	17	12		5
Total	**81**	**72**	**23**	**22**

Source: Salami and Akinyele (2016)

This study was carried out to establish the essence of avenue or street trees in Ibadan metropolis. Twenty respondents were assessed across the six avenues selected in Ibadan metropolis. Table 1 showed the gender distribution of the respondents across the six selected avenues. It was discovered that male population were found to be far higher compared to female population. The result shows that higher percentage of the respondents were male (70%-90%) while lower position were found to be female. This is an indication that most household heads are male while female is only giving the assistance necessary to their spouse (male).The religion distributions of the respondents were presented in (Table 2). The result showed that

for Islamic religion, the highest were found in Familusi Avenue followed by Awosika Avenue, Awolowo, Osuntokun, Are and Rotimi Williams avenue with percentage 60, 55, 45, 40, 40, and 40% respectively. The Christianity religion were found to be higher in Rotimi Williams and Osuntokun avenues followed by Are, Awolowo, Awosika and Familusi with their percentage values of 60, 60, 55, 50, 40 and 35 % respectively.

Consequently, very few respondents were found to be traditional worshippers while non-belonged to other type of religion. The marital distribution (%) of the respondents was presented in Table 3. Very few respondents were single, this ranged between 5-10% across the six avenues. In addition, a large number of respondents were married with the highest value recorded at Rotimi Williams, followed by Awosika, Familusi, Are, Awolowo and Osuntokun with values 80, 75, 70, 65, 60 and 55 % respectively. The result also revealed that some of the respondents are divorcee and widow/widower. The percentage of divorcee ranged from 5-20% while that of widow/widower ranged from 5-15 %.The educational distribution of respondents were presented in Table 4. Some of the respondents had primary school certificate. The higher percentage of primary school holder were found in Familusi avenue followed by Rotimi Williams, Awosika, Awolowo, Osuntokun and none were found in Are. Their values were found to be 20, 10, 5, 5and5 % respectively. The percentage of secondary school holder ranged from 5-15% with the highest in Familusi Avenue. Larger percentage of the respondents passed through tertiary education. The highest were found in Osuntokun, followed by Awosika, Awolowo, Are, Rotimi Williams and Familusi with values of 90, 85, 80, 75, 70 and 60% respectively. This is an indication that higher number of respondents possessed either polytechnic or university degrees. Very few possessed others qualification which may be diploma, religion education etc.

Table 5 showed the age distribution of respondents. The results showed that none of the respondents were found less than 20 years old. This is an indication that virtually all the respondents attained the maturity age. Few respondents fell within the age limit of 21-30 and 31-40 with their values ranging from 5-10 % and 5-20 % respectively. The percentages of respondents within the age bracket of 41-50 years were found to be noteworthy.

The highest were found in Familusi followed by Awolowo, Awosika, Are, Rotimi Williams and Osuntokun avenues within percentage values of 60, 55, 50, 45, 25 and 15% respectively. The respondent within the age bracket of 51-60 years were also found tobe impressive. The highest were found in Osuntokun, followed by Rotimi Williams, Are, Awolowo, Familusi and Awosika with values of 60, 55, 25, 25, 20 and 20 respectively. Some of the respondents were also found above 60 years of age which is regarded as retirement age. Their values ranged from 5-15% across the six avenues.

This result is an indication that very high percentage of the respondents fell between the active age limit. Table 6 shows the population density of the tree species found across the study avenues. The tree population density were found to be higher in Awosika avenue followed by Awolowo, Osuntokun, Familusi, Rotimi Williams and Are with population density of 58, 54, 42, 25, 18 and 5 respectively. Both exotic and indigenous trees were found planted across the six avenues. All the tree species found at the study area were of great importance. Some of them can serve as Fruits (*Citrus spp*, *Magnifera indica*, *Acacia spp*), medicine (*Azadiracta indica, Terminalia catapa, Magnifera indica, Newbouldia leaevis*) some can also serve as timber for poles, construction e.g *Terminalia mentalis, Pinus caribeae, Dypsis lutescens e.t.c*

DISCUSSION

The demographic characteristics of the respondents indicated that male gender were the dominant across the avenues. However, virtually all the respondents were found to be literate thus promoting and enhancing their understanding on urban forestry and greener environment. All trees encountered at the study areas promote environmental sustainability. Lau and Yang (2009) reported attractive, green, and well-watered landscapes as essential constituents of the ideal, paradisal, healthy environment. However, those who lives in greener areas report that their physical and mental health status to be better than those living in less green areas because of constant access to green environment (Sugiyama *et al*., 2008). The trees obtained in this study are in accordance with findings of Govinda and Moyaponger (2015) in India in their findings, they discovered *Azadiracta indica* and *Polyacthia longifolia* and most avenue trees in India. The respondent's purpose for planting these trees was presented in Table 7. From the result, the highest number of respondents planted those trees for aesthetic purpose followed by shading purpose other reasons are erosion control, parking space and wind breaker with values of 87, 24, 2, 1 and 1 respectively. This is in accordance with the findings of Sorensen (1997) who reported that urban greening is a city wide approach to the planning, care and management of all vegetation in a city to secure multiple environmental and social benefits to urban dwellers. Table 8 shows the maintenance culture adopted by the respondents. The higher number of respondent maintained their avenue trees through pruning followed by trimming, watering and manuring with values of 81, 72, 23 and 22 respectively. Sustainable urban development is essential to enhance the quality of life of the citizens and to decrease the impact of cities upon the resources outside the urban context (Odjugo, 2009). An effective urban planning using urban greening strategy is required to contribute to the physical and social development of the cities promoting the land value and the local economy there by reducing Co_2 emission by creating greener environment (Metz *et al.*, 2007).

CONCLUSION

The chief and leading avenue tree species among the selected avenue in Ibadan metropolis was *Polyanthia longifolia* among other trees planted, which was noted to importantly serve as

aesthetic purposes. Other purposes include; shading, erosion control, parking space and wind breaker. There is urgent need for the populace to work on how to maintain the natural ecosystem within the built environment through the concept of Urban Environmental Greening. The planting of trees should be encouraged in all towns and cities. Awareness on the environmental, social and economic importance of trees should be intensified in Nigeria by Local, State and Federal government.

REFERENCES

Adebisi, L. A. Abu, J. E. and Adedodun, M. O. (2002). A review of traditional forest uses. *In:* Popoola, (ed.). Proceedings of a National Workshop organized by FANCONSULT and Edo State Chapter of FAN held in Benin-city, Edo State between 5th and 6th of September, 2002. Pp 42-50.

Agbogidi, O. M. and Eshegbeyi, O. F. (2008): Forestry development for a safe environment. *In:* Onykwelu, J.C., Adekunle, V.A.J. and Oke, D. O. (eds.). Proceedings of the 1st National Conference of the Forests and Forest Products Society of Nigeria (FFPS) held at the Federal University of Technology, Akure, Ondo State, Nigeria between 16th - 18th April, 2008. Pp 95-99

Agbogidi, O.M. and Okonta, A.U. (2009): Biodiversity conservation and poverty alleviation in the Niger Delta area of Nigeria. *Agriculturea Conspectus scientifiucs* 71(3): 103-110.

Aimufia, I.A. (2002): The impact of climate change on forest resources. *In*. Onyekwelu, J., Adekunle, V.A.J. and Oke, D.O.(eds.). Proceedings of the 2nd biennial National Conference of the Forests and Forest Products Society of Nigeria held at the Federal University of Technology, Akure, Nigeria between 26th and 29th of April, 2010. Pp 132-135.

Aliyu, B. S. (2006): Some ethno-medicinal plants of the savannah region of West Africa: description and photochemicals Triumph Publishing Company Ltd, Kano.

Burkill, H. M. (1999): The useful plants of West Africa. Vol. Calesal Piniaceae Royal Botanic Gardens. Longman Publishing U.K.

Etukudo, I. (2000): Forests: our divine treasure. Dorand Publishers, Uyo

Govinda and Moyaponga (2015): Benefits specific applications by dan Burden Senior designer clothing Jackson and walkable Communities. Pp 1-23

Hornby, A. S (2010): Oxford advanced learner`s dictionary of current English page 1-1732

James, P., Tzoulas, K., Adams, M.D., Barber, A., Box, J., Breuste, J., Elmqvist, T., Frith, M., Gordon, C., Greening, K.L., Handley, J., Haworth, S., Kazmierczak, A.E., Johnston, M., Korpela, K., Moretti, M., Niemelä, J., Pauleit, S., Roe, M.H., Sadler, J.P. and Ward Thompson, C. (2009): Towards an integrated understanding of green space in the European built environment. *Journal of Urban Forestry and Urban Greening*. Volume 8, Issue 2, 2009, Pages 65-75

James, P., Tzoulas, K., Adams, M.D., Barber, A., Box, J., Breuste, J., Elmqvist, T., Frith, M., Gordon, C., Greening, K.L., Handley, J., Haworth, S., Kazmierczak, A.E., Johnston, M., Korpela, K., Moretti, M., Niemelä, J., Pauleit, S., Roe, M.H., Sadler, J.P. and Ward Thompson, C. (2009): Towards an integrated understanding of green space in the European built environment. *Journal of Urban Forestry and Urban Greening.* Volume 8, Issue 2, 2009, Pages 65-75

Keay, R.W.J., Onochie, C.F.A. and Stanfield, D.P. (1989): Trees of Nigeria: a revised version of Nigeria trees vols 1 and 2. National Press Ltd, Apapa Lagos. Published by the Department of Forestry Research Institute, Ibadan.

Lau, S. S. Y., and Yang, F. (2009): Introducing Healing Gardens into a Compact University Campus: Design Natural Space to Create Healthy and Sustainable Campuses. *Journal of Landscape Research, 34*(1), 55-81.http://dx.doi.org/10.1080/01426390801981720

Metz, O.D., Bosch P., Dave, R. and Meyer, L (2007): Climate change 2007: Mitigation of Climate change. Agris.fao.org

National Forest Policy (1998): FAO: Strategy to implement the provision of the policy No: 3-1/86-FP. Ministry of Environment and Forest. www.fao.org

Nigeria Geography Information www.oyostate.gov.ng. 2011

Odjugo, O (2009): Quantifying the cost of climatic change impact in Nigeria: Emphasis on wind and Rainstorm. *Journal Human of Ecology* Vol 28 issue 2

Oxford, J. S and Edmund, W (1998). The Oxford English Dictionary.Oxford University Press Vol 5, pp 22,000.

Salami, K. D. and A.O. Akinyele, (2016). Population Density and Values of Avenue Trees: A case study of Ibadan, Oyo State. Proceedings of NTBA/NSCB Joint Biodiversity Conference; Unilorin 2016 (212-217).

Sorenson, N. N (1997): "The Development Dimension of Migrant Remittances: Toward a General Typology", *Migrant Policy Research 10M Working Paper No. 1, June.*

Sugiyama, T., Leslie, E., Giles-Corti, B., and Owen, N. (2008): Associations of Neighbourhood greenness with physical and mental health: do walking, social coherence and local social interaction explain the relationships? *Journal of Epidemiology and Community Health*, *62*, 110-120.http://dx.doi.org/10.1136/jech.2007.064287

Udo, E. S. (2001): The position of forestry in Awa Ibom State. *In*: Udo, E. S. (ed.). Proceedings of the 1st workshop of the Forestry Association of Nigeria Akwa Ibom State Branch in collaboration with the Department of Forestry and Wildlife, University of Uyo, State Ministry of Environment and the UNDP, Akwa Ibom State held in Uyo, Akwa Ibom State between 10th and 11th April, 2001. Pp 31-43.