

URBAN GREENING AND CITY SUSTAINABILITY IN IBADAN METROPOLIS, NIGERIA

***RAHEEM, W.M.¹ AND ADEBOYEJO, A.T.²**

¹Department of Urban and Regional Planning, Faculty of Environmental Sciences,
University of Ilorin, P.M.B. 1515, Ilorin, Kwara State, Nigeria

²Department of Urban and Regional Planning, Faculty of Environmental Sciences,
Ladoke Akintola University of Technology, P.M.B. 4000, Ogbomoso, Oyo State, Nigeria

Abstract

The pace of urbanisation, especially with cities in the developing world, has negatively influenced green areas and, as a consequence, threatened the several benefits provided by vegetation cover. Green areas provide shade, evaporative cooling, rainwater interception, and storage and infiltration functions, with impervious built surfaces. Consequently, the ecosystem services provided by urban green spaces are often overlooked and undervalued. The study uses primary data, which were obtained, through a random and systematic sampling of Three Hundred and Forty Four respondents. Variables used in the analysis include socio-economic characteristics of the respondents, the types of urban green space, benefits of urban green space to the respondents as well as the management strategies involved. Data collected were analysed using descriptive and inferential statistics. ANOVA result shows that there is significant variation in the types of urban greening with F- value of 4.920, 3.673, 4.822; and p- value of 0.001, 0.006 and 0.001 for road greening, residential greening and institutional greening respectively. Besides, the study reveals that most of the areas in the metropolis are more of concrete than open space with 41.8% covered up with 75% concrete, 18.4% with 50% coverage and 16.1% with 100% coverage while 14.3% was covered with 25% coverage and only 9.4% is less than 25% concrete coverage. The study therefore recommends the use of land development plan and the use of planning approval strategies among others, to ensure adequate room for urban green space in the metropolis.

Key Words: *Urban Greening, City, Sustainability, Urban renewal and Metropolis*

Introduction

Urban planning is not restricted only to the built environment such as housing and transportation network; rather, it includes the integration of green spaces into the physical urban landscape (Baycan-Levent, 2009). The urban green spaces literally encompass all public and

private open spaces in urban areas mostly covered by vegetation which are directly or indirectly available for use (URGE, 2004). These include parks, gardens, allotments, wetlands, and urban trees among others.

Greening the urban environment has been variously recognized to offer

*Corresponding Author: Raheem, W.M.

Email: raheemwasiumayowa@gmail.com

benefits of different kind to the urban milieu and the people (Cohen *et al.*, 2008, 2002; Aldous, 2005; Crompton, 2001; Fam *et al.*, 2008; Baycan- Levent and Nijkamp, 2009). This explains why planning concepts such as garden city, green belt, green fingers and greenways highlight the need to preserve the natural environment of urban areas by incorporating many green spaces into the design of cities (Collins, 2012).

According to Chiesura (2004), urban green areas are strategic to the quality of life in cities and evidence of the benefits and importance of these areas especially for environmental, ecological and esthetics. Other benefits include air and water purification, wind filtration, noise pollution mitigation and microclimate regulation, besides the social services such as socialization, recreation and crime prevention.

However, most cities of the world especially in the developing countries have suffered from acute depletion of green spaces principally due to rapid urbanisation, low resource base of institutions on green spaces, lack of priority to green spaces, corruption, political instability and uncooperative attitudes of the local people (Collins, 2012; Mckinney, 2002). For instance, 41 percent of lands reserved for green spaces in Europe have been lost to different land uses (EAA, 2002). Also, rapid urbanisation has caused many cities in West Africa such as Lagos, Kano, Kaduna, Sokoto (Nigeria), Dakar (Senegal), Freetown (Sierra Leone), Abidjan (Cote D'Ivoire), Accra, Kumasi and Tema (Ghana) to lose substantial amount of urban green spaces to urban sprawl and infrastructural developments (Fuwape *et al.*, 2011). Not exempted in this takeover of green space is Abuja (the

capital city of Nigeria) even with all apparatus of government. (Fanan *et al.*, 2011).

The consequences of outright absence and/or insufficiency of green spaces in urban area are enormous and challenging on the environment, and on the people. Environmentally, it has been established that lack of vegetative cover in urban areas makes many African cities "ecologically unfriendly" with configurations that compromise their resilience to climate change (FAO, 2012). Also, tampering with them could result in generating soil erosion, deforestation and their effects on the natural ecology of the environment and climate protection (Jibril, 2010). Flooding is a threat to many large cities, including Lagos, Ibadan and many other urban centres in Nigeria.

Also, as argued by Hall and Tewdwr-Jones (2010), because water and vegetation are pleasant to most people; they are among the city elements with high imageability, which contribute to the formation of a mental map of a city, as well as its positive image. The use of images like mountains and trees to name districts and/or junctions in Ibadan metropolis is an age long tradition, however, while mountains and rivers are retained, perhaps because they are rigid structures that cannot be easily removed, most of the trees have long disappeared. For instance, many areas and districts in Ibadan metropolis named after trees are still in existence but with the trees long ago disappeared. E.g. "Idi Obi", "Idi Ope" and "Idi Osan" translating to Kolanut tree area, Oil palm tree area and Citrus tree area respectively among others. Their disappearance is not unconnected with developments resulting from urbanisation

without concern for their numerous benefits.

Ibadan with all its economic, social attributes as well as its status as administrative headquarters of both the old western region and the present Oyo state has suffered similar fate due to its uncontrolled and unplanned growth (Wahab, 2011). This rapid growth and haphazard plan leads to accelerated disappearance of natural habitat and urban green spaces. Like many cities in the developing world, Ibadan has grown in population and territorial expansion without any concern for the reduction of vegetative land cover, a development that has resulted in a number of environmental implications such as flooding, air pollution, loss of biodiversity and aesthetic pollution among others. Lack of priority for green spaces in the development agenda of the city has also hindered the growth of green spaces in the metropolis.

This study therefore attempts to assess the urban greening in Ibadan metropolis with a view to suggesting policy issues.

Study Area

Ibadan, one of the fastest growing cities in Nigeria is located in Oyo State in the south-west geo-political zone of Nigeria. It is the capital of Oyo State and

lies on latitude 7° 25' North and longitude 3° 5' East and is located approximately 145 km north of Lagos and 530 km southwest of Abuja, the Federal Capital Territory. It also lies about 120 km east of the border with the Republic of Benin. It is situated close to the boundary between forest and grassland, which makes it a meeting point for people and products of both the forests and grassland areas. Ibadan is regarded as the largest indigenous city in tropical Africa.

The physical setting of the city consists of ridges of hills that run approximately in northwest – southeast direction. The largest of these ridges lies in the central part of the city and contains such peaks as Mapo, Mokola and Aremo. These hills range in elevation from 160 to 275 metres above sea level and thus afford the visitor a panoramic view of the city.

The average temperature of Ibadan is 27°C, with a range of 4°C; the mean annual rainfall is above 1,505mm while the relative humidity is between 60% and 80%. The vegetation, of Ibadan is rainforest. It has tall trees exist in different heights; they form canopies i.e. lower, middle and upper layers; it has numerous heterogeneous species of trees like Iroko, Obeche and Mahogany.

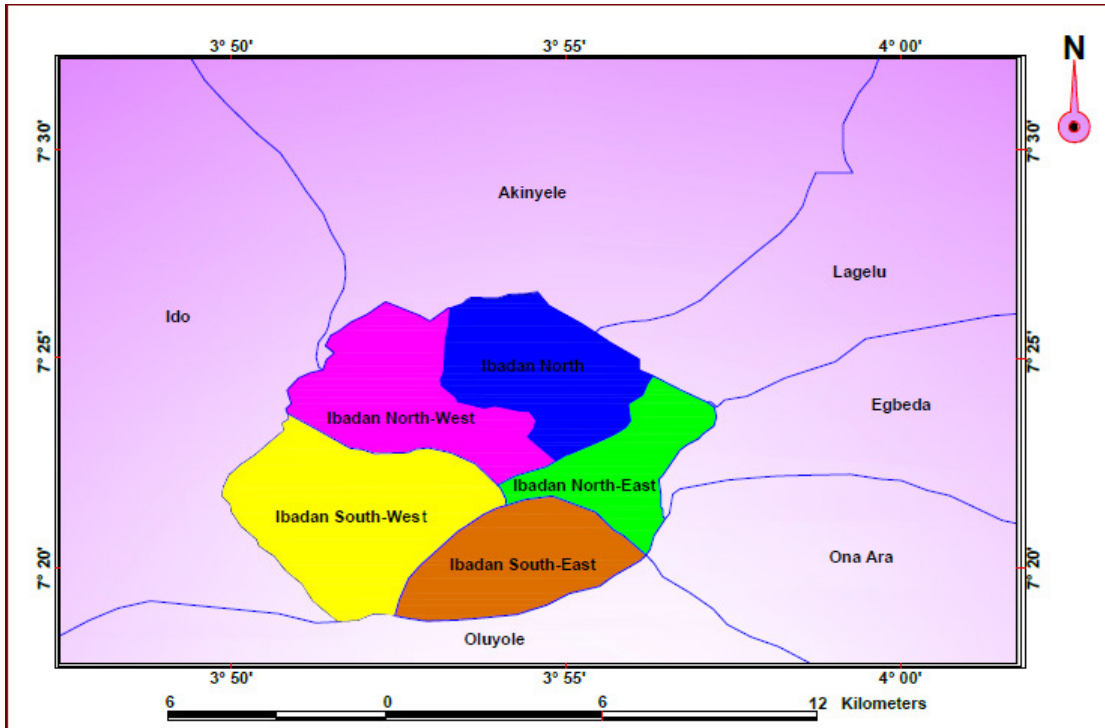


Figure 1: Ibadan Metropolis

Methodology

The study makes use of primary and secondary data, while the primary data were sourced from the respondents and reconnaissance survey, the secondary data were obtained by consultation with the ministry of environment for documents on government policy on urban greening programmes in the study area in particular and Oyo State in general.

Structured questionnaires were administered on 344 respondents from the five local government areas of Ibadan metropolis comprising of Ibadan North (Bodija), Ibadan North East (Iwo road), Ibadan South East (Mapo), Ibadan South West (Oluyole) and Ibadan North West

(Onireke) Local Governments. The systematic random sampling technique was used to select houses and random sampling was thereafter used to select the respondents.

Both descriptive and inferential types of analysis were carried out on the data. Descriptive analysis was used for analyzing data in the nominal and ordinal scale, where results were put in frequencies, percentages, and tables. Maps, charts and graphs were used appropriately to illustrate the result. Inferential Statistical tool of One-Way Analysis of Variance (ANOVA) was employed to examine the spatial variation in the types of urban green space across the study area.

Results and Discussion

Table 1: Socio-economic characteristics of respondents in Ibadan Metropolis

Socio-economic Variables	Frequency	Percentage (%)
Gender		
Male	229	66.6
Female	115	33.4
Total	344	100.0
Age		
18 – 30 Years	60	17.4
31 – 40 Years	71	20.6
41 – 50 Years	96	27.9
51 – 60 Years	88	25.6
61 and Above	29	8.4
Total	344	100.0
Marital Status		
Single	59	17.2
Married	267	77.8
Divorced	11	3.2
Separated	1	0.3
Widow	5	1.5
Total	344	100.0
Ethnicity		
Yoruba	267	77.6
Igbo	58	16.9
Hausa	11	3.1
Non Nigeria	4	1.2
Others	4	1.2
Total	344	100.0
Educational qualification		
No formal Education	22	6.4
Quranic education	6	1.7
Primary Education	31	9.0
Secondary Education	94	27.4
Tertiary Education	189	55.0
No response	2	0.5
Total	344	100.0
Occupation		
Not employed	45	13.1
Farming	5	1.5
Artisan	43	12.5
Self-employed	68	19.8
Trading and business	93	27.0
Civil Service	89	25.9
No response	1	0.2
Total	344	100.0
Income (Monthly)		
Below US\$250	158	52.8
US\$255 - US\$500	98	32.8
US\$505 - US\$750	27	9.0
US\$755 - US\$1000	11	3.7
US\$1005 - US\$1250	2	0.7
US\$1255 and above	3	1.0
Total	299	100.0

The study reveals majority male with 66.6% while the female has 33.4%, this is supported by (NPC, 2006). The age structure reveals that majority of the respondents fall in the age structure between the ages 41 and 50 years with 27.9%.

Respondents' distribution by ethnicity indicates majority of Yoruba with 77.6%. Others are Igbo 16.9%, Hausa with 3.2%, other Nigerian ethnicity has 1.2% while non-Nigerian makes up 1.2%. This distribution is quite understandable owing to the fact that Ibadan is one of the ancient Yoruba cities.

Furthermore, the study reveals that married people constitute the bulk of the respondents with 77.6%, a development that could lead to higher population density and impact negatively on green space areas (Fuwape and Onyekwelu, 2011).

The study also indicates more than half of the respondents with tertiary education certificate (55.3%). This is followed by secondary and primary education with 27.5% and 9.1%, while 6.4% and 1.8% are recorded for no formal education and Quranic education respectively. It can be deduced from this therefore that the respondents are

generally informed and this might have gone a long way to enhance the study.

In the distribution of respondents in the occupational category, most of the respondents are into trading (27%), civil servants (25.9%) followed by self-employment (19.8%), unemployed (13.1%), artisan (12.5%) and farming (1.5%). The highest percentage recorded by trading might not be far from the increasing rate of unemployment in the country pushing many to find ways to eke out a living.

Income distribution according to the study shows that majority of the respondents (52.8%) fall below US\$250 while another significant proportion (32.8%) claims they earn between US\$255 and US\$500 (9.0%) in the US\$505 - US\$750 category, while 3.7%, 1.0% and 0.7% earn between US\$755 - US\$1000, US\$1005 - US\$1250 and US\$1255 and above respectively. The study confirms the general observation that people in the developing world consider income issue very personal and something to be hidden from public knowledge. The reason for this is to a greater extent due to the fear of increased taxation and some other levies that many think may accompany such information.

Table 2: Types of Urban Greening in Ibadan Metropolis

Types of urban green space	Frequency	Percentage (%)
Road greening	58	17
Public squares and parks	17	5
Residential green space	167	49
Institutional green space	73	21
River greening	29	8
Total	344	100

As indicated in table 2, generally, the study finds that (17%) of the metropolis has road greening, 5% constitutes public squares and parks, 49% has residential

green space, 21% institutional green space and 8% river greening. It can thus be deduced that residential green space dominates in the metropolis, followed by

institutional green space; this may not be unconnected with the domination of residential land use in the metropolis, as 40-50% of urban land allocation is devoted to residential land use (Obateru, 2005). Institutional green space coming second might be as a result of large expanse of space devoted for open space by institutions such as educational and administrative institutions. Public squares and parks greening recording a low percentage is an indication that such type of green space in Ibadan metropolis is less developed.

As can be seen from the table 3, the combined landscaping records the highest Ibadan metropolis with 60.1%, while hard landscaping has 23% and soft landscaping records the lowest with 16.9%. By implication, the preponderance of hard landscaping in the metropolis is perhaps largely responsible for the incessant occurrence of erosion and flood ravaging the city almost on yearly basis resulting in loss of lives and properties.

Table 3: Types of Landscape in the metropolis

Landscape types	Frequency	Percentage (%)
Hard landscaping	79	23
Soft landscaping	58	16.9
Combined landscaping	207	60.1
Total	344	100.0

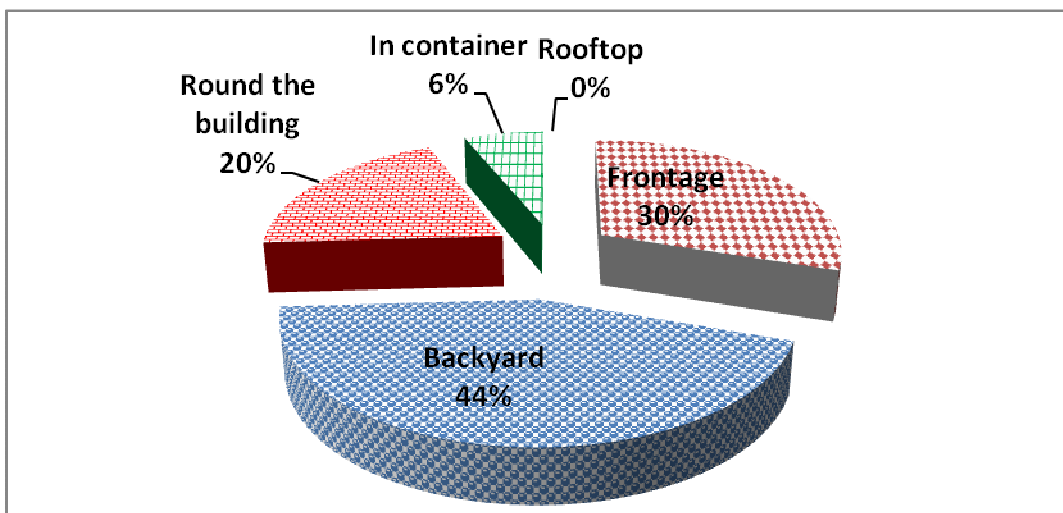


Figure 2: Distribution of Green Space

Figure 2 reveals the distribution of green space at different locations in Ibadan metropolis, it shows that green space at backyard records 44%, in the frontage of building 30%, while having green space round the building has 20% and in container 6%. It is however

noteworthy that rooftop green space is not available at all in the study area. While substantial numbers of building have backyard green space though at low coverage, the frontage green space is quite low, this might not be unconnected with other land uses into which frontal

setbacks are put, such as commercial activities and placement of makeshift shops among others.

Of particular interest here is the 0% presence of greening on the roof. From this, it can generally be deduced that at diverse degree, green spaces are available at different locations in the respondents'

residence except on the roof. The absence of roof top greening may be attributable to the cost, lack of technology, (Qazi, 2010) knowledge and resources to develop such designs in this part of the world and conservatism on the part of the people.

Table 4: Percentage coverage of concrete in the residence

Local government		Percentage coverage of concrete					Total
		<25%	25%	50%	75%	100%	
Ibadan North	Number	14	21	15	27	2	79
	Row %	17.7	26.6	19	34.2	2.5	100
	Column %	43.8	42.9	23.8	18.9	3.6	23.1
Ibadan North East	Number	4	6	5	50	20	85
	Row %	4.7	7.1	5.9	58.8	23.5	100
	Column %	12.5	12.2	7.9	35	36.4	24.9
Ibadan North West	Number	3	7	12	12	3	37
	Row %	8.1	18.9	32.4	32.4	8.1	100
	Column %	9.4	14.3	19.0	8.4	5.5	10.8
Ibadan South east	Number	8	8	17	21	14	68
	Row %	11.8	11.8	25	30.9	20.6	100
	Column %	25	16.3	27	14.7	25.5	19.9
Ibadan south west	Number	3	7	14	33	16	73
	Row %	4.1	9.6	19.2	45.2	21.9	100
	Column %	9.4	14.3	22.2	23.1	29.1	21.3
Total	Number	32	49	63	143	55	342
	Row %	9.4	14.3	18.4	41.8	16.1	100
	Column %	100	100	100	100	100	100

$X^2 = 62.476, df = 6, p = 0.000$

Table 4 is the presentation of percentage coverage of concrete of respondents' residences. It shows that 41.8% of residence with 75% concrete, 18.4% with 50% coverage and 16.1% with 100% coverage while 14.3% claimed their own residence is 25% coverage and only 9.4% of residence is less than 25% concrete. This can thus be interpreted to mean that majority of the residences in the study area 76.3% have half of their plot area covered with concrete surface. This can be adduced to be reason why the city experience excessive heat and flooding because most of the open spaces

that could have served as openings for percolation have been covered up.

This might also account for excessive heat experienced in the city centre which on many occasions results into ailments such as meningitis, small pox and other heat related diseases (Adeboyejo *et al.*, 2012). Also, concrete surfaces are known to generate Urban Heat Island (UHI), excessive run off leading to flood and also likely to result in high rate of energy consumption due to high energy demand for air conditioning and others (Solecki *et al.*, 2008)

It can be noted also that, most of the buildings go contrary to the planning standard that stipulates 40% development of plot area. This implies high impervious surfaces and goes to show the extent to which urban surfaces are concrete. The overall effects of this phenomenon can be numerous ranging from excessive heat, high runoff and flooding. It may also result in shortage of water as water table might be far away the immediate surface.

Spatial Variation in the Types of Urban Green Spaces in Ibadan Metropolis

Earlier analyses show differences in the types of urban green spaces across the local government areas; however, the study intends to see the statistical variation and therefore uses ANOVA tools to establish the result of variation. Some of the greening types available are road greening, public parks and squares, residential green space, institutional green space, river greening; and other greenings and the result is presented in the table 5

Table 5: Analysis of Variance (ANOVA) of variation in types of Green Spaces in Ibadan

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Road greening	Between Groups	3.511	4	.878	4.920	.001
	Within Groups	60.486	339	.178		
	Total	63.997	343			
Public parks and squares	Between Groups	.181	4	.045	.666	.616
	Within Groups	23.002	339	.068		
	Total	23.183	343			
Residential green space	Between Groups	2.893	4	.723	3.673	.006
	Within Groups	66.755	339	.197		
	Total	69.648	343			
Institutional green space	Between Groups	3.988	4	.997	4.822	.001
	Within Groups	70.105	339	.207		
	Total	74.093	343			
River greening	Between Groups	.790	4	.198	1.818	.125
	Within Groups	36.835	339	.109		
	Total	37.625	343			
Others	Between Groups	.015	4	.004	.637	.636
	Within Groups	1.974	339	.006		
	Total	1.988	343			

Table 5 shows results of ANOVA establishing spatial variations in the types of green spaces availability in the metropolis of Ibadan. According to the table, types of greening spaces vary significantly across the metropolis, while others reported no statistical significance in the study area. In actual fact, out of six variables of urban greening, three were

found to have significantly varied, while the remaining three are observed to have reported otherwise. For instance, road greening, residential green spaces, and institutional green spaces observed to have F- values of 4.920, 3.673, 4.822; and P-values of 0.001, 0.006, 0.001 respectively. This implies that there is significant variation in the existence of

road greening, residential and institutional green spaces at $P < 0.05$ confidence level. It can however, be inferred that availability of road greening, residential and institutional green spaces do not remain the same across the Local Government Areas of Ibadan metropolis under study.

In a sharp contrast, it is also observed from table 5 that public park and squares, river greening; and other greenings do not significantly vary with F-values of

0.666, 1.818, 0.637 and $P <$ values of 0.616, 0.125, 0.636 respectively. It can however, be established that there is no statistical variation in the existence of public park and squares, river greening; and other greenings, at $P < 0.05$ confidence level. The implication of this finding is that the situation of public park and squares, river greening; and other greenings is actually the same things across the metropolis of Ibadan.

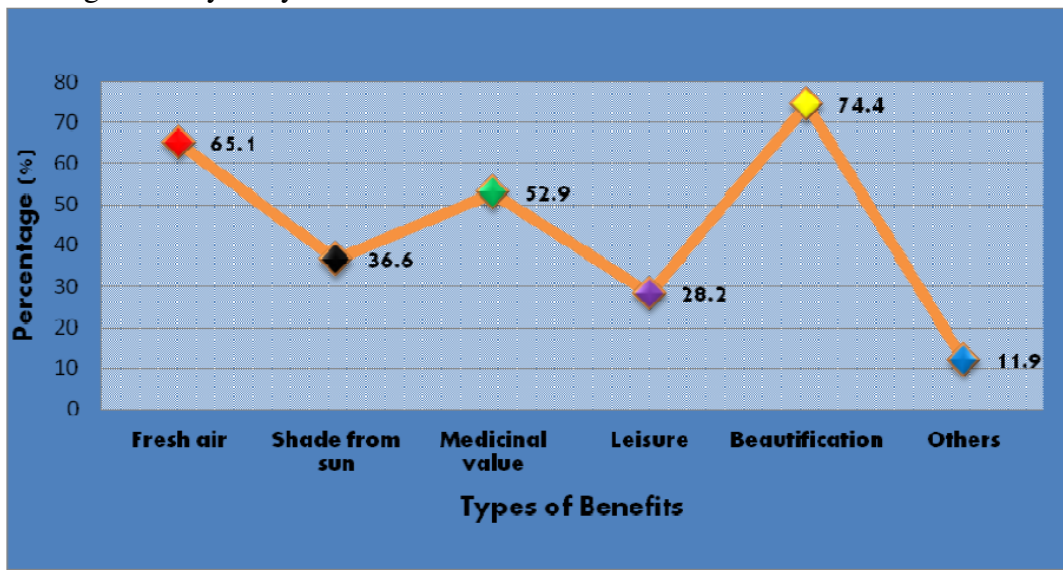


Figure 3: Benefits of Urban Green Spaces

Figure 3 reveals the various benefits offered by urban green space as given by the respondents. 74.4% of them claimed the benefit to be beautification, fresh air has 65.1% and 52.9% goes for medicinal value. Also, the respondents who agreed to urban green space benefits in terms of shade from the sun are 36.6% while 28.2% and 11.9% are for leisure and others respectively.

It can thus be inferred from the figure that majority of the respondents agreed urban green spaces provide aesthetic for urban environment, this might not be unconnected with the age long attachment

to flowers as means of decoration and beautification.

Another striking result here is the medicinal value with 52.9%. For the fact that Ibadan is an indigenous city, it may not be out of place that most of the respondents have awareness of using one or two roots, bark and/or leaves of trees for therapeutic purposes. Besides, culturally, many people in this part of the world are familiar with the value of leaves and root of shrubs and tree for alternative medicinal purpose. The low percentage recorded by leisure as indicated by the figure might be as a result of the traditional nature of the people of metropolis.

Table 6: Other benefits of green space

Local Government Area	Reduction of Runoff			Purification of Air			Protection of Biodiversity			Provision of Employment			City Image		
	Yes	No	Total No	Yes	No	Total No	Yes	No	Total No	Yes	No	Total No	Yes	No	Total No
Ibadan N (%)	55.7	44.3	79	41.8	58.2	79	46.8	53.2	79	16.5	83.5	79	20.3	79.7	79
Ibadan NE (%)	41.2	58.8	85	41.2	58.8	85	57.6	42.4	85	97.6	2.4	85	32.9	67.1	85
Ibadan NW (%)	41.0	59.0	39	43.6	56.4	39	41	59	39	17.9	82.1	39	15.4	84.6	39
Ibadan SE (%)	45.6	54.4	68	44.1	55.9	68	45.6	54.4	68	30.9	69.1	68	35.3	64.7	68
Ibadan SW (%)	32.9	67.1	73	32.9	67.1	73	34.2	65.8	73	46.6	53.4	73	26.0	74.0	73
Total (%)	43.6	56.4	344	40.4	59.6	344	45.9	54.1	344	45.9	54.1	344	27.0	73.0	344

Reduction of runoff: $X^2 = 8.532$, $df = 4$, $p = 0.074$

Purification of air: $X^2 = 2.354$, $df = 4$, $p = 0.671$

Protection of biodiversity: $X^2 = 9.118$, $df = 4$, $p = 0.058$

Provision of employment: $X^2 = 137.688$, $df = 4$, $p = 0.000$

City image: $X^2 = 8.418$, $df = 4$, $p = 0.077$

Table 7: Impediments to urban green spaces in Ibadan metropolis

Local Government Area	Lack of space			Poor attitude of the people			Competition with other land uses			Poor management techniques		
	Yes	No	Total No	Yes	No	Total No	Yes	No	Total No	Yes	No	Total No
Ibadan N %	42.9	57.1	77	41.6	58.4	77	28.6	71.4	77	36.4	63.6	77
Ibadan NE %	98.8	1.2	84	52.4	47.6	84	94.0	6.0	84	27.4	72.6	84
Ibadan NW %	35.9	64.1	39	35.9	64.1	39	38.5	61.5	39	53.8	46.2	39
Ibadan SE %	45.5	54.5	66	37.9	62.1	66	40.9	59.1	66	42.4	57.6	66
Ibadan SW %	55.6	44.4	72	26.4	73.6	72	55.6	44.4	72	61.1	38.9	72
Total %	59.2	40.8	338	39.6	60.4	338	54.1	45.9	338	42.6	57.4	338

Lack of space: $X^2 = 77.387$, $df = 4$, $p = 0.000$

Poor attitude of the people: $X^2 = 11.415$, $df = 4$, $p = 0.022$

Competition with other land uses: $X^2 = 82.729$, $df = 4$, $p = 0.000$

Poor management techniques: $X^2 = 21.289$, $df = 4$, $p = 0.000$

From table 6, it can be observed that 55.7% of the respondents claimed that urban green space help in reduction of runoff while the least in terms of reduction of runoff is Ibadan Southwest with 32.9%, for purification of air, Ibadan Northwest dominates with 43.6% while the least is Southwest with 32.9%. responses to protection of biodiversity as the benefit derived from urban green space shows that Ibadan Southwest is leading with 65.8%, while others are in the ranges of 59% for Ibadan Northwest, 54.4% Southeast and 53.2% Ibadan North.

It can be deduced that the respondents are aware of one benefit or the other of green spaces, of particular reference as far as the study area is concerned is the use of green spaces as city image, it is a common practice in Ibadan as done elsewhere to use trees as landmarks either for identification and/or description of places E.g “Idi Arere”, “Idi Oro”, “Idi Osan” and “Idi Ope” among others literally translating to- on the side of “Arere” tree, Mango tree, Citrus tree and Oil palm tree respectively. Although, these planning ideas predated modern

planning, they are still in vogue in the study area up till date.

Shown in table 7 is the distribution of diverse problems facing urban green space in the study areas and as responded to by the respondents, 59.2% of the respondents report lack of space for urban greening activities, while poor attitude towards urban green space, competition with other land use and poor management have 39.6%, 54.1% and 42.6% respectively.

It can therefore be inferred that lack of space is a dominant problem against urban green space in Ibadan metropolis. This development may not be far from the truth considering the land value in the urban centres especially where maximum use of land is put into consideration for maximum returns. This largely explains the relevance of the theory of “The Four Zone City Model” of Smit *et al.* (1996) used in this study where green spaces in the core area are usually restricted to steep slopes, railway lines, in containers and land not suitable for development among others primarily due to lack of space for such activities.

Table 8: Factors responsible for disappearance of urban green space in Ibadan metropolis

Factors for disappearance	Frequency	Percentage (%)
Dumping of refuse	18	11.2
Erection of structure	97	60.2
Lack of maintenance	43	26.7
Insecurity	3	1.9
Total	161	100

Using table 8, it is revealed that of all the factors contributing to the decreasing of urban green spaces in the study area, erection of structure has the highest proportion with 60.2%, this is followed by lack of maintenance 26.7%, while dumping of refuse and insecurity have 11.2% and 1.9% respectively.

It can thus be inferred that erection of structure in most of the hitherto vacant spaces have now been developed, this is expected as the value of land in urban centres appreciate daily and therefore prompts owners to either develop them or sell them out to buyers whose target is solely to maximize returns. This

development, as previously identified therefore restricts green spaces to slopes, rivers and wedges where development cannot be supported. This finding is not different from that of previous studies of

this nature where urbanization has been among other factors, singled out to have been responsible for the destruction of urban green spaces (Collins, 2014; Opkala, 2009)

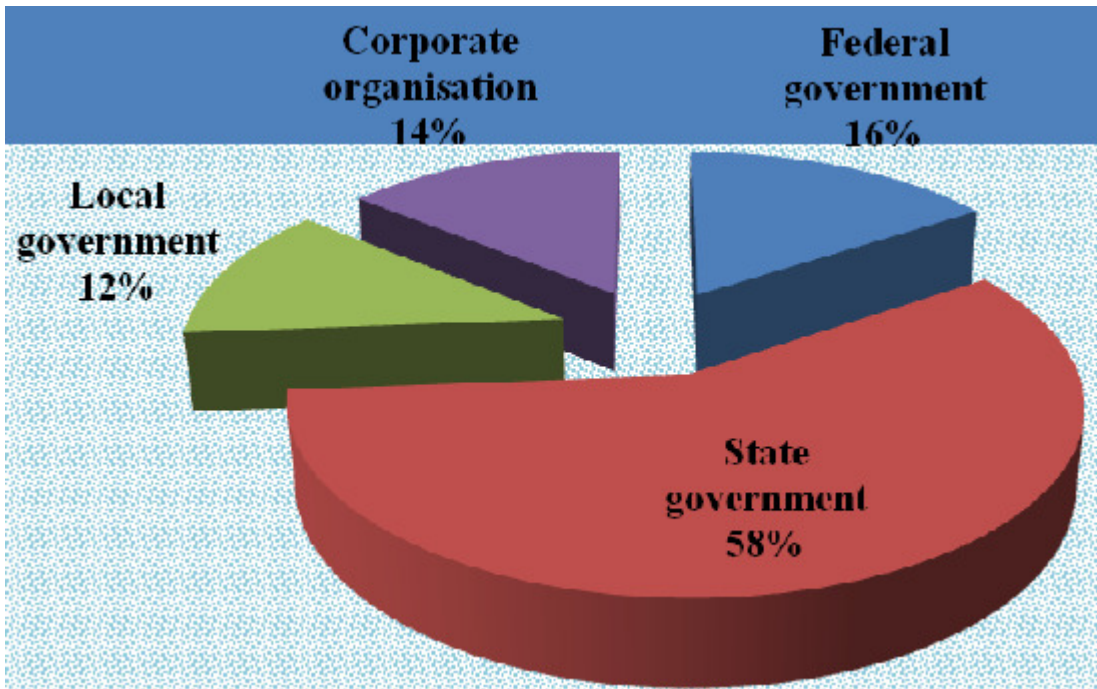


Figure 4: Institutions responsible for urban green space management

As can be seen in figure 4 above, the institutions responsible for the management of public urban green space is pictorially depicted and shows that state government is the major manager of urban green space in Ibadan metropolis with 58%, federal government has 16%, local government 12% while Corporate Organisations are claimed to have the remaining 12%. It can therefore be deduced that the state government is a major stakeholder in the management of green space in the study area.

Recommendations

Based on the major findings of this study, the following recommendations are offered as policy issues toward a

sustainable management of urban green areas in Ibadan metropolis.

1. There is need to officially commission a land use plan or at least urban renewal plan aimed at allocating spaces for greenings in the metropolis.
2. Since the highest proportion of the metropolis is concrete using hard landscaping, government should intensify efforts by making sure all available spaces such as rail lines, power lines and steep slopes as well as river courses and hilly spaces considered not fit for development are greened in order to compensate for the vast hectares of built ups in the city centre.

3. There is also the need to reduce concrete space and Urban Heat Island (UHI) as much as possible. On this, government should evolve a legislation prohibiting the total concretization of residential, commercial and institutional areas.
4. There should be sensitization campaign on the importance of maintaining green space around human habitat and people should be mandated to keep greenings in containers both inside and outside all existing structures whether residential or commercial. Special attention should also be given to the green roofs, courtyards, green walls, streets, balconies, which integrate greening methods of reducing hard surfaces. This will go a long way in at least making up for the space concretised in the urban centres, and also serve as avenue to promote urban agriculture to achieve goal 2 of the United Nation Sustainable Development Goals 2030 (Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture) (UN 2015)
5. The use of planning approval strategies to correct the past anomalies. One of the main issues in the metropolis is lack of space as virtually all space have been developed, Planning Authorities saddled with the responsibility of approval of building plans should be awake to their responsibility by ensuring that further developments in the metropolis are made to comply strictly with the 35- 40% plot development standards (Obateru, 2005), so as to secure substantial space for green areas development.
6. Massive tree planting should be prioritized in the urban centres: Rather than being selective in road greenings, government should ensure that all road setbacks, median and shoulders are planted with green vegetation and tree should be planted along roads to serve as shade for pedestrians. This, aside beautification will also reduce urban temperature emanating from the macadamized road surfaces.
7. All the frontage setbacks encroached by makeshift shops and commercial activities should be demolished, tilled and made to remain green by enforcement from relevant agencies in the state. In case this is too cost for owners to carry out, government at the local and state levels should take over the job of ensuring the greening of these areas.

Conclusion

The study has examined the urban greening and city sustainability in Ibadan metropolis, Nigeria. It looks at the types of urban green space, the benefits and impediments as well as management strategies involved.

The study reveals that various types of urban green spaces exist in the study area. This ranges from residential green space, institutional green space to road greening and public squares and parks among others. It also shows that roof green space is non-existent at all in the metropolis and that the study area is predominantly concrete leaving very insignificant space for urban greening. Also, where road median and setback are left for green space development, such

spaces are stiffly competed for with refuse dump and commercial activities.

It therefore recommends land development plans, the use of planning approval instrument to enforce the maximum plot development and enlightenment campaign on green space benefits among others. All these suggestions will certainly have far reaching effects in the development and sustainability of greening in the metropolis of Ibadan in particular and Nigerian urban centres in general.

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