

SURVEY OF TREES AND SHRUBS USED FOR AMENITY PURPOSES IN EKITI STATE

Olujobi, Olagunju John

Department of Forestry, Wildlife and Fisheries Management,
Ekiti State University, P.M.B. 5363, Ado-Ekiti, Nigeria.

E- mail: olujobioj@yahoo.com

+234 803 8079 501

ABSTRACT

Amenity uses of landscape trees to mankind in terms of provision of healthy environment and other aesthetic values are sometimes greater than the monetary value of their marketable wood. This study assesses the diversity and distribution of trees used for amenity purposes in Ekiti State. A total of one hundred and sixty pre-tested questionnaires were randomly administered to respondents for collection of data. Results obtained revealed that Thirty one (31) different trees/shrubs are planted for amenity purposes in the study area with *Ficus thonningii* having the highest percentage of occurrence (10.51 %). These trees are mostly planted in schools (18.96 %), hospitals (17.63 %) and markets (16.91 %,) by the respondents across the study area to provide various economic, socio-cultural and environmental benefits. Considering the important role been played by these urban trees/shrubs in environmental amelioration, government should enact laws mandating estate developers to plant trees in their compound for urban greening.

Key words: Survey, trees, shrubs, amenity, Ekiti-State .

1.0 INTRODUCTION

Tree species composition often vary widely amongst cities in relation to urban histories, geographical location, land area or the natural environmental conditions notably climate, soil and topography (Miller, 1997). The actual floristic composition of a place is the resultant of an intricate interplay between inheritance and enrichment (Mc bride and Jacobs, 1986). In some cities, natural disasters serve as a periodic selective force to modify species

composition. Some cities have bequeathed tree from the pre-urbanization vegetation, whereas others has no trees to inherit or have completely eradicated them in the course of development (Mc pherson and Luttenger, 1998). Most trees in build-up areas have been consciously planted by public agents or private citizens. Species selection by horticulturist and environmental managers for public areas and preferences of property-owners of private plots, have jointly contributed to urban-forest make-up. Some cultivated trees are native, whereas others are introduced from other lands near and far.

The protection and enhancement of environment particularly residential and office premises is a core objective of amenity tree planting. Amenity value of a tree means how highly the trees are regarded by the community as part of the local landscape. In the broadest sense amenity trees are any trees that are not grown or managed for their value as a timber or their products only, but also for the provision of other benefits or services (Nilson *et.al.*, 2001, Hayson and Murphy, 2003). A tree provides many benefits to the urban dweller, both environmental (Jim and Chen, 2009), psychological (Sugiyama *et.al.*, 2008; Laforteza *et.al.*, 2009), economical (Nilson *et.al.*, 2001) and socio-cultural (Coder, 2004). The presence of trees, whether grouped together in green spaces or lining streets, is considered essential in improving the quality of life and well-being of city dwellers. In cities, trees have been considered to fulfill a primarily ornamental purpose; however, there is no doubt that they also perform other equally important functions, such as their use for recreation (Gundersen *et.al.*, 2006), their role as a link between man and nature (Aldous, 2007), and their contribution to the general well-being of the city's residents (Dwyer, *et.al.*, 2000). There are also economic benefits associated with amenity trees such as increased land, property, and rental value (Mansfield, *et.al.*, 2005). Trees can enhance environments economically where people show a positive trend in their willingness to pay more for goods and services (Joye, *et.al.*, 2010).

The ecological services and environmental benefits offered by amenity trees are greatly influenced by composition of species and number of trees. Urban forest structure is a measure of various attributes of amenity tree vegetation, including tree species composition, tree density and species diversity etc. High diversity of trees in urban areas is considered imperative for the maintenance and development of healthy urban life style (Bassuk, *et.al.*, 2009). Different habitats in a city vary in growth conditions for trees and accordingly exhibit varying levels of tree diversity (Peuleit, *et.al.*, 2002). (Sabo, *et.al.*, 2003), attributed this difference in tree diversity to higher levels of stressful conditions in different habitats such as elevated temperatures, low air humidity, increased pollution and limited soil volume.

Although most people express a concern for amenity trees and consider them very important, many lack the basic knowledge and skill needed in the management and selection of appropriate tree species for amenity purpose. Diversity plays an important role in the long-term stability of an ecosystem when an area has a high diversity of tree species; it is less likely to suffer catastrophic loss from diseases or pest. In the same way high species diversity reduces tree vulnerability to pest and diseases. It is on this note that assessing the diversity of trees and shrubs used for amenity purposes in Ekiti State becomes imperative.

2.0 METHODOLOGY

2.1 Study area

The study was carried out in Ekiti State Nigeria. Ekiti state is located in South west Nigeria. It lies south of Kwara and Kogi State. It is bounded in the west by Osun State, in the east and south by Ondo State. It is located between Longitude 4° 5' East and 5° 45' and Latitude 7° 51' and 8° 51' North. Ekiti State has 16 local government councils with the State capital located at Ado- Ekiti. The estimated population of the State according to population census of 2006 was put at 2,398,957. The state consists of homogenous ethnic group all speaking Ekiti dialect. The state covers about 7,500 km² of land mass. The climate is of

West Africa monsoon type with dry and wet season. The raining season normally start from late March to October with occasional strong wind and thunder storm, usually at the onset and at the end of the season. The dry season normally start from November to March and it is characterized by cold wind of harmattan.

The topography is hilly with large number of hills of various sizes surrounding most of the towns and villages. The state is mainly an upland zone, rising above 250 m above the sea level. The annual rainfall ranged from 1,500 mm to 2,000 mm (Adebayo, 1993). Temperature ranges from 21° C to 32° C throughout the year. Annual average relative humidity is about 90 % at 7.00 am and 65 % at 4.00 pm. There are two major ecological zones in Ekiti-State: tropical rainforest exist in the southern part while derived savanna predominates in the northern peripheries. The vegetation is evergreen composed of many varieties of hardwood tree species.

2.2 Sampling technique

A multistage sampling technique was employed in the study. The study area was stratified into two zones on the basis of vegetation viz: the derived savanna to the northern peripheries and rain forest zone to the southern part. Two local governments were purposively selected from each vegetation zones. Two towns were selected from each local government area. Twenty (20) respondents from each of the towns were randomly selected for interview (Table 1).

2.3 Data collection and analysis

Pre-tested semi-structured interview schedule which sought questions on socio-economic characteristics of the respondents, species of tree planted, and specific uses of each species among others were administered to respondents. Administration of the questionnaires was by personal interview since most of the respondents could not read and write and more also to

have total retrieve of the questionnaire. Data collected were analyzed using descriptive statistics to produce frequency table and percentage.

Table 1: Distribution of Respondents in the study area.

Vegetation zone	Local government	Towns	No of respondents
Rain forest	Ise/Orun	Ise-Ekiti	20
		Orun-Ekiti	20
	Ekiti west	Erinjiyan-Ekiti	20
		Oke Imesi –Ekiti	20
Derived savannah	Ilejemeje	Iye-Ekiti	20
		Ewu-Ekiti	20
	Ekiti east	Omuo-Ekiti	20
		Ilasa-Ekiti	20
Total	4	8	160

3.0 RESULTS

3.1 Socio-economic characteristics of respondents

Table 2 presents information on socio-economic characteristics of respondents in the study area, the results shows that 67.5 % of the respondents are male while 32.5 % are female in the rain forest zone. In the derived savannah zone, 70 % of the respondents are male while 30 % are female. Respondents' marital status shows that 57.5 % and 67.5 % are married in rain forest and derived savanna zones respectively, while 17.5 % and 21.25 % of the respondents are single in rain forest and derived savanna zones respectively. Result on level of education shows that 16.25 % and 3.75 % of the respondents are not educated in rain forest and derived savanna zones respectively, while 31.23 % and 31.25 % had tertiary education in rain forest and derived savanna zones respectively.

Table 2: Demographic information of the respondents

Variables	R. F (freq.) N =80	%	D. S (freq.) N=80	%	Total	Percentage (%)
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Sex						
Male	54	67.5	56	70	110	68.75
Female	26	32.5	24	30	50	31.25
Marital status						
Married	46	57.5	54	67.5	100	62.5
Single	14	17.5	17	21.25	31	19.38
Divorce	9	11.25	5	6.25	14	8.75
Widow	11	13.75	4	5	15	9.37
Educational background						
Non-formal education	13	16.25	03	3.75	16	10
Primary school	14	17.5	14	17.5	28	17.5
Secondary school.	28	35	38	47.5	66	41.25
Tertiary	25	31.23	25	31.25	50	31.25
Total	80	100	80	100	160	100

R. F. = Rain forest, D. S. = Derived savanna

3.2 Distribution of tree species planted for amenity purposes in the study area

Table 3 shows that thirty one (31) different trees and shrubs are either retained or planted for amenity purposes by the respondents in the study area with *Ficus thonningii* been the species most planted with 10.51 %, followed by *Senna siamea* (7.75 %), *Teactona grandis* (6.86 %), *Ficus ptatyphylla* (6.78 %), *Terminalia catapa* (6.63 %), *Gmelina arborea* (5.96%), *Azadirata indica* (5.74 %) and *Newbouldia laevis* (5.14 %) respectively.

Species distribution across the state (Table 3) shows that *Ficus thonningii* has the highest percentage distribution of 11.69 % and 9.39 % in the rain forest and derived savanna zone respectively. *Senna siamea* has 7.95 % in derived savanna and 7.53 % in the rain forest. *Teactona grandis* and *Gmelina arborea* are more common in derived savanna with 8.09 % and 7.08 % respectively.

Table 3: Distribution of respondents by trees species retained or planted for amenity purposes

Local name	Scientific name	Rain forest	%	Derived savanna	%	Total	(%)
Odan	<i>Ficus thonningii</i>	76	11.69	65	9.39	141	10.51
Ishin	<i>Bligha sapida</i>	4	0.62	4	0.58	8	0.59

Cassia	<i>Senna siamea</i>	49	7.53	55	7.95	104	7.75
Ose	<i>Adansonia digitata</i>	16	2.46	18	2.60	34	2.34
Iru	<i>Parkia biglobosa</i>	18	2.77	34	4.91	52	3.87
Oruwo	<i>Morinda lucida</i>	5	0.77	4	0.58	9	0.67
Teak	<i>Teactona grandis</i>	36	5.54	56	8.09	92	6.86
Gmelina	<i>Gmelina arborea</i>	31	4.77	49	7.08	80	5.96
Osan	<i>Citrus sinensis</i>	32	4.92	29	4.19	61	4.55
Iroko	<i>Milicia excels</i>	22	3.38	31	4.48	53	3.95
Porogun	<i>Dracaena arborea</i>	22	3.38	19	2.75	41	3.06
Akoko	<i>Newbouldia laevis</i>	40	6.15	29	4.19	69	0.59
Atorin	<i>Glyphea brevis</i>	2	0.31	6	0.87	8	5.14
Udi	<i>Terminalia galucescens</i>	4	0.62	9	1.30	13	0.97
Afara	<i>Terminalia supaba</i>	0	0	3	0.43	3	0.22
Ope	<i>Elaeis guineesis</i>	8	1.23	26	3.76	34	2.53
Oro	<i>Iringia garbonensis</i>	2	0.31	7	1.01	9	0.67
Almond	<i>Terminalia catapa</i>	39	6	50	7.23	89	6.63
Dongoyaro	<i>Azadirata indica</i>	46	7.08	31	4.48	77	5.74
Obi	<i>Kola nitida</i>	22	3.38	17	2.46	39	2.91
Kasu	<i>Anacardium occidentale</i>	39	6	26	3.76	65	4.84
Ekikan	<i>Spondias mombin</i>	6	0.92	6	0.87	12	0.89
Agbalumo	<i>Chrysophyllum albidum</i>	6	0.92	0	0	6	0.45
Iya	<i>Alchorea laxiflora</i>	3	0.46	0	0	3	0.22
Agbagba	<i>Ficus platyphylla</i>	41	6.31	50	7.23	91	6.78
Agunmaniye	<i>Gliricidia sepium</i>	20	3.08	7	1.01	27	2.01
Ewuro	<i>Vernonia amygdalina</i>	20	3.08	29	4.19	49	3.65
Mangoro	<i>Mangifera indica</i>	41	6.31	26	3.76	67	4.99
Oganwo	<i>Khaya senegalensis</i>	0	0	3	0.43	3	0.22
Pine	<i>Pinus Spp</i>	0	0	2	0.29	2	0.15
Laali	<i>Lawsonia inermis</i>	0	0	1	0.14	1	0.07
Total		650	100	692	100	1342	100

3.3 Amenity functions and environment where trees are planted in the study area

Table 4 shows that 23.45 % of the respondents do plant tree to provide shade in the study area, this is followed by ornamental/beautification with 18.29 %. Other uses as mentioned by the respondents include medicinal purpose (8.70 %), provision of fruits/food (7.64 %) and groove preservation (6.22 %), while protection against wind and cultural purposes has 5.68 % each. Table 5 shows that home compound, school, market, worship

centers and road side are the areas where trees are mostly planted and utilized by the respondents for amenity purposes with 18.96 %, 17.63 %, 16.91 %, 15.46 % and 13.16 % respectively. Also the result shows that each tree species serve more than one purpose and as well appear in more than one environment (Table 6).

Table 4: Distribution of respondents by amenity functions provided by trees

Uses and service	Rain forest	%	Derived savanna	%	Total	Percentage (%)
Environmental functions						
Shade	65	22.73	67	24.19	132	23.45
Ornamental/beautification	62	21.68	41	14.80	103	18.29
Wind break	19	6.64	13	4.69	32	5.68
Fresh air	15	5.24	17	6.14	32	4.62
Erosion control	15	5.24	11	3.97	26	4.26
Socio-cultural functions						
Food/Fruit	25	8.74	18	6.49	43	7.64
Medicinal	22	7.69	27	9.75	49	8.70
Groove preservation	14	4.89	21	7.58	35	6.22
Cultural purposes	8	2.79	16	5.78	24	5.68
Fencing	11	3.85	18	6.49	29	5.15
Preserving shrines	12	4.19	10	3.61	22	3.91
Boundary marking	9	3.15	12	4.33	21	3.73
Therapeutic use	9	3.15	6	2.17	15	2.66
Total	286	100	277	100	563	100

Table 5: Distribution of respondents by types of environment where trees are planted.

Environment trees are planted	Rainforest	%	Derived savanna	%	Total	Percentage (%)
Home compound	78	18.93	79	18.99	157	18.96
School	76	18.45	70	16.83	146	17.63
Hospital	12	2.91	16	3.85	28	3.38
Groove	7	1.70	11	2.64	18	2.17
Worship centers	53	12.86	75	18.03	128	15.46
Office car park	22	5.34	20	4.81	42	5.07
Road/street line	62	15.05	47	11.30	109	13.16

Relaxation centers	6	1.46	6	1.44	12	1.45
Artisans' workshop	14	3.40	18	4.33	32	3.86
Shrine/historical centers	10	2.42	6	1.44	16	1.93
Market	72	17.48	68	16.34	140	16.91
Total	412	100	416	100	828	100

Table 6: Environment where trees are planted and their specific uses

Local name	Botanical name	Uses and services of the trees	Types of environment where trees are planted
Odan	<i>Ficus thonningii</i>	Shade, cultural, herb	Home compound, market, shrine
Ushin	<i>Bligha sapida</i>	fruit, shade, herb	Home compound
Cassia	<i>Senna siamea</i>	Shade, wind breaker, herb	School, hospital, road sides, worship/relaxation centers, Home compound
Ose	<i>Adansonia digitata</i>	Fruit, cultural, medicinal herb	Market, shrine, historical site, palace
Iru	<i>Parkia biglobosa</i>	Food, medicinal herb	Home compound
Oruwo	<i>Morinda lucida</i>	Shade, medicinal herb	Home compound
Teak	<i>Tectona grandis</i>	Shade, wind breaker,	School, hospital, road sides, worship/relaxation centers, Home compound
Gmelina	<i>Gmelina arborea</i>	Shade, wind breaker	School, hospital, road sides, worship/relaxation centers, Home compound
Osan	<i>Citrus sinensis</i>	Fruit, shade	Home compound
Iroko	<i>Milicia excels</i>	Shade, cultural, herb	Market, shrine, groove
Porogun	<i>Dracaena arborea</i>	Shade, cultural, herb,	Market, shrine, groove, palace
Akoko	<i>Newbouldia laevis</i>	Shade, cultural, medicinal herb	Market, shrine, groove, palace
Atorin	<i>Glyphea brevis</i>	Shade, cultural, medicinal herb	Market, shrine, groove, palace
Udi	<i>Terminalia galucescens</i>	Shade, cultural, medicinal herb	Market, shrine, groove
Afara	<i>Terminalia supaba</i>	Shade, medicinal herb,	Market, shrine, groove
Ope	<i>Elaeis guineensis</i>	Vegetable oil, wine, cultural use,	School, home compound
Oro	<i>Irvingia garbonensis</i>	Fruit, medicinal herb	Home compound, palace
Almond	<i>Terminalia catapa</i>	Shade, wind breaker, fruit	Home compound, school, car park
Dongoyaro	<i>Azadirachta indica</i>	Medicinal herb, shade,	Hospital, school, office car park
Obi	<i>Kola nitida</i>	Fruit, cultural use	shrine, palace
Kasu	<i>Anacardium occidentale</i>	Fruit, medicinal herb, shade	Home compound, school, car park
Ekikan	<i>Spondias mombin</i>	Fruit, medicinal herbs, cultural	Home compound, palace
Agbalumo	<i>Chrysophyllum albidum</i>	Fruit	Home compound,
Iya	<i>Alchonea laxiflora</i>	Medicinal herb, shade	Home compound
Agbagba	<i>Ficus ptatyphylla</i>	Shade	Home compound, Market, shrine,
Agunmaniye	<i>Gliricidia sepium</i>	Shade	Home compound, workshop
Ewuro	<i>Vernonia amygdalina</i>	Shade /fuel, fresh air, timber	Home compound
Mangoro	<i>Mangifera indica</i>	Fruit, shade	Home compound, school, offices

Oganwo	<i>Khaya senegalensis</i>	Timber, medicinal herb, shade	Home compound, Market, shrine, groove
Pine	<i>Pinus spp</i>	Shade,	Car park, hospital, Home compound
Laali	<i>Lawsonia inermis</i>	Beautification	Home compound

3.4 Growth form and mode of propagation

Table 7 present the growth pattern and mode propagation of each amenity tree species in study area. The results revealed that majority of the trees are broad leaf, ever green and also propagated by seed.

Table 7: Growth form and mode of propagation

Local name	Botanical name	Growth form	Tree propagation
Odan	<i>Ficus thonningii</i>	BLD	Stem cutting
Ushin	<i>Bligha sapida</i>	BLE	Seed
Cassia	<i>Senna siamea</i>	BLE	Seed
Ose	<i>Adansonia digitata</i>	BLD	Seed
Iru	<i>Parkia biglobosa</i>	BLD	Seed
Oruwo	<i>Morinda lucida</i>	BLE	Seed
Teak	<i>Tectona grandis</i>	BLD	Seed
Gmelina	<i>Gmelina arborea</i>	BLE	Seed
Osan	<i>Citrus sinensis</i>	BLE	Seed
Iroko	<i>Milicia excels</i>	BLD	Seed
Porogun	<i>Dracaena arborea</i>	BLE	Stem cutting
Akoko	<i>Newbouldia laevis</i>	BLE	Seed & Stem cutting
Atorin	<i>Glyphea brevis</i>	BLE	Seed & Stem cutting
Udi	<i>Terminalia galucescens</i>	BLE	Seed
Afara	<i>Terminalia supaba</i>	BLD	Seed
Ope	<i>Elaeis guineensis</i>	Palm	Seed
Oro	<i>Irvingia garbonensis</i>	BLD	Seed
Almond	<i>Terminalia catapa</i>	BLD	Seed
Dongoyaro	<i>Azadirachita indica</i>	BLE	Seed
Obi	<i>Cola nitida</i>	BLE	Seed
Kasu	<i>Anacardium occidentale</i>	BLE	Seed
Ekikan	<i>Spondias mombin</i>	BLD	Stem cutting
Agbalumo	<i>Chrysophyllum albidum</i>	BLE	Seed
Iya	<i>Alchonea laxiflora</i>	BLE	Seed
Agbagba	<i>Ficus ptatyphylla</i>	BLD	Stem
Agunmaniye	<i>Gliricidia sepium</i>	BLE	Seed & Stem cutting
Ewuro	<i>Vernonia amygdalina</i>	BLE	Seed Stem cutting
Mangoro	<i>Mangifera indica</i>	BLE	Seed
Oganwo	<i>Khaya senegalensis</i>	BLD	Seed
Pine	<i>Pinus spp</i>	Conifer	Seed

Laali	<i>Lawsonia inermis</i>	BLE	Seed
BLD = Broad leaf deciduous, BLE = Broad leaf evergreen,			

4.0 DISCUSSION

The result from this study showed clearly the predominant involvement of married men in the use of trees and shrubs for amenity purposes in the study area (Table 2). The observed higher percentage of this group of respondents revealed that men as the head of the family owns it as their duties to provide for the essential needs of their family in terms of maintenance of good and healthy environment, protection of the land from degradation by erosion and other natural deserters, conservation and preservation of culture and historic sites in the study area. Bassuk *et.al.*, (2009), similarly reported that amenity trees play an important role in the maintenance and development of healthy urban life style. Also the greater involvement of men in the usage of trees and shrubs for amenity purposes in the study area could be as a result of the fact that men especially the elderly ones, usually gathered in the evening under the shade of trees (Table 5) to hold political meetings, drink palm wine, and play games. In addition, the elders sometimes also meet under special and dedicated trees early in the morning or in the evening to settle quarrels among members of the community.

The educational background of the respondents revealed that about sixty five percent of the respondents are not well educated (Table 2). These groups of people perhaps are peasant farmers with low income who could not afford luxury in term of fan, and air condition in their homes, as such they usually sit under the trees around their compound to receive fresh air especially during the hot weather day. The observed high no of trees species retained or planted by the respondents is an indication that the people in the study area appreciates the ecosystem functions of trees around them and the capacity of trees to provide different goods and services to satisfy their economic and social needs. Similar observation has been reported by De Groot *et.*, (2007) and Scott, (2007).

The observed wide spread distribution of the tree species across both the rain forest and the derived savanna zones in the study area with the exception of few, is an indication that these tree species are well adapted and tolerant to different weather conditions. Planting and retention of trees in virtually all public places such as school, hospital, market, praying ground, and street/road sides, car park, hotel, shrine and grove is an attestation that trees were cherished for their amenity functions which ranges from provision of shade, provision of food, boundary demarcation, cultural uses, protection against strong wind to noise reduction and other aesthetic values. This assertion is in agreement with the submission of Grande-Ortiz *et.al.*, (2012), who similarly reported that amenity trees species were cherished for their environmental, social, cultural and economic functions. Similarly Coder, (2004) reported that amenity trees growing on a particular site has the capacity for the protection of the surrounding environment and in addition providing comfort for both animals and humans living in that environment. Easy way of propagation through seed and cutting of some of these amenity tree species could be a major factor that favours their acceptability among the respondents in the study area.

The broad leaf evergreen nature of most of the tree species identified probably make them to function mostly as shade tree in schools, hospitals, local markets and praying grounds. Also the evergreen nature of most of these species could be another factor that makes them suitable for environmental amelioration in term of purification of atmosphere for fresh air, beautification and other aesthetic values (Akbar *et.al.*, 2014). In addition most of the deciduous species usually shed their leaf at flowering stage, and these flowers with their beautiful colours make them to serve as ornamental in streets and parks.

5.0 CONCLUSION AND RECOMMENDATIONS

The result of this study has revealed that quite a no of tree species mostly indigenous were either planted or retained by respondents across the study area to provide different essential products and also to perform different environmental, economic and socio-cultural functions both around the home compounds and in public places. The study also revealed that most of these amenity tree species could be easily raised or propagated through seed while some through stem cutting. Consequent upon the role played by these amenity trees and shrubs in particular the maintenance of healthy environment and wellbeing of man in general, it is therefore recommended that urban foresters and arboriculturists should come together and form a formidable force to champion the campaign for environmental forestry and urban greening, this can be done in conjunction with the government through free distribution of seedlings to people on every annual tree planting campaign day.

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