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ASSESSMENT OF ECONOMIC AND RECREATIONAL EFFECTS OF TREES IN URBAN AREAS; A CASE OF ADO EKITI, NIGERIA.

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ABSTRACT

Trees have been known to promote tourism and enhance economic development. They also contribute to the quality of housing and working environments. This research is on economic and recreational effect of trees in urban areas using Ado Ekiti, Nigeria as a cases study.

Primary data was collected with the aid of questionnaires. The study area was divided into five zones because of the areal differentiation of the zones for questionnaire administration and correlation analysis was carried out on the variables. The results shows indicate clearly that there is a positive correlation (r= 0.72) between tree planting and recreation activities. This suggests that the more trees that are planted, the more the opportunities for recreational activities.

Keywords: Outdoor Activities, Recreation, Trees, Tree planting.

INTRODUCTION

The role of trees in our environment cannot be overemphasized. They serve as renewable energy sources that can be replenished naturally over time. Trees also provide many benefits including

maintaining clean air for us to breathe, sources of everyday products, like paper and matchsticks. Trees are also popular for providing shade where humans can enjoy various recreational activities like board games.

Trees create a landscape that is attractive to recreation and residential areas, an environment where people want tolive and work. Trees are a vital element of the landscape and bring many benefits such as provision of shade, beauty, aesthetics and other benefits to the visitors (Firdaus*et al.,* 2016). In additions, trees also promote a sense of place and support a wide variety of wildlife, flora, and fauna (Masbiha and Noriah, 2010).

Traditionally, the main benefits of trees relate to health, aesthetic and recreational benefits in the environment. Moreover, trees have also provided people with subsistence by providing food, fodder, fuel, wood and timber for construction. They can provide a feeling of being close to nature in the urban areas hence constitute an important part of urban life. This paper therefore assesses the economic and recreational effects of trees in urban areas using Ado – Ekiti Nigeria as a case study.

LITERATURE REVIEW

Usually, a tree is regarded as any plant with the general form of an elongated stem, or trunk that supports the photosynthetic leaves or branches at some distance above the ground. Trees are also typically defined by height (Gschwantner, 2009). A commonly applied narrower definition which differentiates trees from shrubs is that a tree has a woody trunk formed by secondary growth, meaning that the trunk thickens each year by growing outwards, in addition to the primary upwards growth from the growing tip. Under such a definition, herbaceous plants such as palms, bananas and papayas are not considered trees regardless of their height, growth form or stem girth (Coder, 1999).

Trees are used in recreation and have a positive effect on various aspects of quality of life and human wellbeing. They form key natural components of the rural and urban ecosystems and contribute to many aspects of the ecosystem, including that of environmental improvement, ecological and biodiversity enrichment, aesthetic enhancement, economic, social and health benefits (Jim and Zhang, 2013).

Furthermore, mature trees have immense value, and proper care is required to preserve these valuable landscape assets. As part of their environmental contributions, trees reduce noise pollution by absorbing sounds, reducing the temperature in hot weathers, reducing runoff and providing cleaner water. In social contributions, trees in recreation areas areused to improve outdoor leisure and recreation experiences in parks. In urban areas, recreation centers represent a designed landscape pattern and are popular as relaxation spotareas and are suitable for relaxation (Noralizawati, and Noriah, 2009).

Also, the use of trees in recreation areas can significantly increase property values and will attract more visitors to come. Recreation areas containing a significant number of trees contribute to preserving and purifying the air in the environment (Farahwaheeda *et. al,* 2009). Trees in the recreation area or green areas can help reduce the temperature by creating a beautiful shade. Besides, trees play an important role in recreation activities by providing a meeting place and leisure area, where people can meet to engage in various recreational activities. According to Waits (2008), state that existence of recreation areas in cities introduces nature to visitors through outdoor education.

Trees also aid in pollution reduction by removing gaseous air pollution primarily by uptake via leaf stomata, though some gases are removed by the plant surface. Once inside the leaf, gases diffuse into intercellular spaces and maybe absorbed by water films to form acids or react with inner-leaf surfaces. Trees also directly affect particulate matter in the atmosphere by intercepting particles, emitting particles (e.g., pollen) andre-suspension of particles captured on the plant surface. Some particles can be absorbed into the tree, though most intercepted particles are retained on the plant surface (David *et al.*, 2014).

THE STUDY AREA

The study area was divided into five zones for easy data collection and for comparison purposes i.e.

Zone 1 - Fajuyi – Dallimore – Textile – Basiri – Adebayo area

Zone 2 – Okesa-Ereguru, OkeOri-Omi, Palace, Oja-Oba, Ijigbo

(the core area).

Zone 3 – Oke-Ila, Federal and State Housing Estates, Mathew,
Odo-Ado Area.
Zone 4 – Ajilosun, Oke-Bola, Coca-Cola, Omolayo area.
Zone 5 – Irona, Elekute, Omisanjana, Falegan area.

The zones were divided in such a way that each of the zones linked up with the periphery i.e. the peri-urban fringe, except zone 2 which has within the core area. This was to make sure that at least one major road linking the periphery and other towns surrounding the study area was accessible directly to each zone, to ascertain if the city really has direct link with the peri-urban. Zone 2 was carved out, for comparison purposes as it was the only zone that has no direct link with the periphery except through other zones. Hence, it was regarded as the core area, otherwise referred to as the Central Business District (CBD).

RESEARCH METHODS

The primary data for this work was obtained through administration of questionnaire), and personal observation. This method was employed for this research work because it provided first-hand information needed for this kind of research and more information was made available because of the physical presence of and time devotion by the interviewer.

The secondary data were obtained from relevant and up-to-date published materials like maps, and bulletins from different ministries and parastatals. The maps used for this research work were obtained from the Ministry of Works, Lands and Housing; Data on planting and management of trees in the Ado-Ekiti urban centre were obtained from the Ministry of Agriculture and Rural Development. Ministry of Environment was also visited to confirm if they partake in the management and tree planting campaign.

For the purpose of this research work, the population consists of the population of trees within the urban and peri-urban area of Ado-Ekiti, the building that houses the different trees and the occupants of the buildings. The population of Ado-Ekiti was put at 308,621 which comprises of 155,073 males (58.7%) and 153,548 females (41.3%) by the 2006 population census (National Population Commission, 2006).

To take count or know the various aspect of a population whether human or otherwise, the whole population can be covered in a census. Where, however, the population is large and relatively homogenous, a sample can be taken from the population which will be representative, thereby reducing the time, cost of data collection, processing and presentation of data. In this work systematic random sampling technique was employed for the data collection.

A total of 1,200 copies of questionnaires were administered in the study area. As earlier mentioned, the area was divided into five zones because of the areal differentiation of the zones, 260 copies of questionnaires were administered in each of zones 1, 3, 4 and 5 while 160 copies of questionnaires were administered in zone 2. Systematic random sampling techniques were used in administering the questionnaire.

Only landlords of each sampled building were interviewed where possible, because some of the questions in the questionnaire can only be answered accurately by someone who knows why and when the trees were there. But in some buildings where the landlords were not living there, tenants who had lived in the house for not less than five years were interviewed.

RESULTS AND DISCUSSIONS

Table 1 shows the zones and the number of questionnaire administered and retrieved. It was only in zone 2 that we recorded 100% retrieval of the questionnaires administered. Zone 4 had the least percentage of retrieval (86.9%). This is because some of the respondents were not cooperating enough on the questionnaire. The percentage retrieved from each zones (Table 3.1) were found to be representative enough and adequate for this research work.

The data collected were presented and analysed using both descriptive and quantitative methods. The descriptive analysis include the use of tables, charts, frequencies, percentages and maps. The quantitative analysis includes the use of product moment correlation co-efficient to test the relationships between the variables, i.e., forestry in the urban centre and recreation.

Hypotheses 1: The Null hypothesis stated that "there is no relationship between number of trees and *'Ayo', Ludo* or draft game recreation in Ado-Ekiti.

The total number of trees in the study area was obtained (Appendix II) and the number of trees used for recreational – *Ayo,* Ludo and draft were also obtained zone by zone to give a cumulative total of 231 (24.8%) (Table 5.6)

Correlation analysis was carried out on the variables. This indicate clearly that there is a positive correlation (r= 0.72) between tree planting and recreation (Table 2). The implication of this is that the more trees that are planted, the more the opportunities for recreational activities. This also corroborated what was obtained in table 1 where not less than 24.8% (zone 1) and 32.5% (zone 2) of the respondents plant trees for recreational purposes in their compounds.

In conclusion, the null hypothesis that states "there is no relationship between number of trees and ludo, 'Ayo' or draft game recreation in Ado-Ekiti was rejected in favour of the alternative hypothesis that states "there is a relationship between number of trees and *Ludo 'Ayo*' or draft game recreation in Ado-Ekiti.

TABLE 1: REASONS FOR TREE PLANTING

REASONS	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
Landscaping	69	27.1	22	27.5	85	34.7	43	31.4	78	31.7	297	31.9
Recreational *Ayo, Ludo* and Draft	63	24.8	26	32.5	68	27.8	4	24.8	70	28.5	231	24.8
Food (Fruits)	112	44.1	21	26.3	75	30.6	34	24.8	67	27.2	309	33.2
Fuel wood	4	1.6	03	3.8	4	1.6	11	8.0	15	6.1	37	4.0
Economic Purposes	6	2.4	08	10.0	12	4.9	15	1.9	16	6.5	57	6.1
Total	254	100	80	100	245	100	137	100	246	100	931	100

Source: Field Survey, 2016

Table 2: CORRELATION ANALYSIS OF TREE PLANTING AND RECREATION

		NUMBER OF TREES	NUMBER OF TREE STANDS USED FOR RECREATION
Number of Trees	Pearson correlation	1	.719**
	Sig. (2-tailled)	.	.000
	N		
Number of Tree Stands Used For Recreation	Pearson correlation	.719**	1
	Sig (2-tailed)	.000	.
	N	961	961

**Significant at the 0.01 level

Source: Computer Outputs SPSS/PC+, 2016

A lot of reasons have been adduced for not planting trees. Some said that leaves of the trees litter the compound while some opined that trees are difficult to maintain because they can harbour dangerous animals and reptiles. Table 5.8 indicates that most of the respondents did not plant trees or some have even uprooted the ones they planted due to the high population and the need to accommodate the increasing population. In table 5.8, approximately 64% (others) of the respondent in zone 1 said they have to remove the trees to pave way for shops or more residential buildings as this give them more money than having the trees in the compound. The trend is the same in all the zones except zone 4 that had approximately 22% of the respondents removing trees for shops. This was so because the area or the zone does not belong to the areas where we have population pressure especially by students. It could be observed that while government and others are campaigning for tree planting, some are removing the already planted trees due to poverty as the respondents acknowledged the importance of trees to the compound and even to the town in general. Some people still have to remove trees because they needed money. Also people living in rented accommodation with no security of tenure will probably not be interested in tree planting, since it is a long-term investment and they were not the owner of the house. However, the longer they stayed, and the more secured they felt, the more likely they were to accommodate the possibilities of growing their own fruits in the locality, and perhaps planting some trees for a variety of purposes.

TABLE 3: REASONS FOR NOT PLANTING TREES

REASONS	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
It litters the compound	16	17.1	34	31.8	28	22.0	24	43.6	29	20	131	24.8
Difficult to maintain	19	19.1	10	9.4	14	11.0	19	34.6	15	10.4	77	14.6
Underneath too cold for comfort	-	-	3	2.8	5	3.9	-	-	7	4.8	15	2.8
Others	60	63.8	60	56.0	80	63.0	12	21.9	94	64.8	306	57.8
Total	94	100	107	100	127	100	55	100	145	100	529	100

Source: Field Survey, 2016

TABLE 4: HARVESTING AND SELLING OF THE ECONOMIC TREES IN THE COMPOUND

METHODS	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
Harvested & sold in pieces to individual	2	1.8	18	11.9	42	26.1	18	22	36	19.9	116	16.9
Harvest & sold in bulk to individual	1	0.9	6	4	10	6.2	28	34.1	8	4.4	53	7.7
Harvested & cold in bulk to Industry & Comp.	6	5.3	2	1.3	3	1.9	4	4.9	6	3.3	21	3.1
Harvest & consumed within the family and friends	102	92.0	125	82.2	106	65.8	32	39	131	72.4	496	72.3
Total	111	100	151	100	161	100	82	100	181	100	686	100

Source: Field Survey, 2016

Information from table 5.9 shows the different ways of harvesting and selling of the economic trees in the compounds. In all the zones of the study area, highest percentages of the respondents (zone 1, 92%; zone 2, 82.2%; zone 3, 65.8%; zone 4, 39%; and zone 5, 72.4%) preferred to harvest the fruits and consume them within the family and friends. They said they used it to supplement the sources of food for the family. A sizeable number of the respondents also harvested and sold the fruits in pieces to individuals. The percentage range between 1.8% in zone 1 and 26.1% in zone 3. Very few respondents harvested their fruits and sold in bulk to individual, as low as 0.9% in zone 1. Zone 4 had an exception with approximately 34% of the respondents. Some of the respondents said it also served as a source of raw materials to industries as zones 1 to 5 had 5.3%, 1.3%, 1.9%, 4.9% and 3.3% respectively of their respondents harvesting their fruits and sold in bulk to industries and companies. In general, it could be observed that tree planting could be used to boost food production and also as a source of raw materials for industries. This assertion agreed with FAO (1999) where they suggested that tree planting could be used to boost food production and poverty reduction in the developing countries.

There are a lot of advantages that could be derived from the planting of trees in a compound. For easy explanation and discussion, it was grouped under four sub-headings as shown in table 5.10. In Zone 1, 43.5% of the respondents said they used the trees as a source of relaxation centre for the family, while in zone 2, it was 45.7% of the respondents. Zone 3 had 39.6% which was the highest in the zone and zone 4 and 5 had 31.2% and 44.7% of the responses obtained. Some respondents used the trees as a means of moderating the temperature in their compounds. 46.5% and 29.6% in zones 1 and 2 respectively believed that the trees were to give succour for the high temperature that was being experienced. Zone 3, 4 and 5 had 26.1%, 29.4% and 32.6% respectively also supported the view. 5% of the respondents in zone 1 used the trees in their compound to boost the economy of the family by selling the fruit while 9.9% and 28.6% in Zones 2 and 3 were of the same opinion. 13.4% in Zone 4 and 21.9% in Zone 5 shared the same view. Very few respondents had the opinion of cutting down the branches of the trees for fuel wood. The percentages range between 0.8% in zone 5 and 6.2% in zone 2. Some of the respondents believed that trees could be planted for all of the aforementioned groups. For instance, 1% in zone 3, and 21% in Zone 4 all said the trees were there for all of the above options. This corroborated the opinion of Afolabi (2006) that human life depends on other

species for food, shelter, and breathable air, plant pollution, waste assimilation and other environmental life-support services. All these could be obtained from planting trees in and around our city environments.

TABLE 5: ADVANTAGES OF TREE(S) PLANTED IN THE COMPOUND

ADVANTAGES	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
Relaxation centre for the family	88	43.5	37	45.7	97	39.6	37	31.2	110	44.7	369	41.3
Moderation of temp in the compound	94	46.5	24	29.6	64	26.1	35	29.4	80	32.6	297	33.3
Boosting the economy of the family by selling the fruits	10	5.0	08	9.9	70	28.6	16	13.4	54	21.9	158	17.7
Branches cut down for fuelwood	8	4.0	05	6.2	12	4.9	6	5.0	2	0.8	33	3.7
All of the above	2	1.0	7	8.6	2	0.8	25	21	-	-	36	4.0
Total	202	100	81	100	245	100	119	100	246	100	893	100

Source: Field Survey, 2016

TABLE 6: SPECIES OF TREES IN THE COMPOUND

SAME SPECIES?	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
Yes	38	28	28	18.8	51	20	34	20.5	46	20	197	22.5
No	97	72.0	121	81.2	143	80	132	79.5	184	80	677	77.5
Total	135	100	149	100	194	100	166	100	230	100	874	100

Source: Field Survey, 2016

Table 5 shows the diverse species of trees in the compound of the respondents. The table shows that 28% of the respondents in zone 1 had the same species in their compound while 72% had diverse species in their compound. The trend continued in all the zones, i.e. the diverse species had higher percentages over the single specie in the compound. This shows that the respondents preferred to plant different type of species in their compound to allow for fuller advantages of all the types of trees whether edible or non-edible. They also plant different species to guide against all the trees in their compound shedding their leaves at the same time.

Table 5.12 shows the different orientation of the trees to the building in different compounds. The table shows that there is no definite trend followed by the respondents in planting their trees. In all the zones i.e. zones 1, 2, 3, 4 and 5, 40.3%, 9.3%, 35%, 27.6% and 16.8% respectively planted their trees at the northern part of their compound. The Eastings are 22.7%, 38.7%, 27.2%, 23.6% and 19.5% in zones 1, 2, 3, 4 and 5 respectively. The westings had a higher percentage in zone 2, 42.7% and Zone 5, 43.4%. In the other three zones i.e. zone 1, 3, and 4 they had 18.5%, 18.4% and 28.1% respectively. The southings had 18.5%, 9.3%, 19.4%, 20.7% and 20.3% in zones 1, 2, 3, 4 and 5 respectively. The implication of this analysis is that only very few of the respondents knew how to use the trees for reducing urban heat. This is so because only very few of them plant the trees towards the East to prevent early morning heat from their building or towards the west to absorb the afternoon/evening heat or to provide shade for the building. The best way to plant trees for heat prevention and amelioration is to plant the trees towards the Eastern and Western part of the building(s).

TABLE 7: RELATIVE ORIENTATION OF THE TREE(S) TO THE BUILDING

ORIENTATION	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
North	94	40.3	14	9.3	72	35.0	56	27.6	38	16.8	274	26.9
East	53	22.7	58	38.7	56	27.2	48	23.6	44	19.5	259	25.4
West	43	18.5	64	42.7	38	18.4	57	28.1	98	43.4	300	29.5
South	43	18.5	14	9.3	40	19.4	42	20.7	46	20.3	185	18.2
Total	233	100	150	100	206	100	203	100	226	100	1018	100

Source: Field Survey, 2016

TABLE 5.13: TREES STAND

TYPE OF TREE	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
Edible	476	72.8	176	68.0	539	60.4	432	57.0	347	56.8	1970	62.2
Non-Edible	176	27.0	83	32.0	353	39.6	320	43.0	264	43.2	1196	37.8
Total	652	100	259	100	892	100	743	100	611	100	3166	100

Source: Field Survey, 2016

TABLE 5.14: TYPE OF FUELWOOD USED AS A SOURCE OF ENERGY

TYPE OF FUEL WOOD	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
Charcoal	38	42.2	40	39.2	45	40.9	12	29.3	31	40.3	166	39.5
Firewood	42	46.7	54	52.9	50	45.5	28	68.3	36	46.7	210	50.0
Planks	10	11.1	8	7.9	15	13.6	-	-	10	13	43	10.3
Others	-	-	-	-	-	-	1	2.4	-	-	1	0.2
Total	90	100	102	100	110	100	41	100	77	100	420	100

Source: Field Survey, 2016

TABLE 5.15: THE SOURCES OF FUELWOOD USED

SOURCES	NO OF RESPONSE											
	ZONE 1		ZONE 2		ZONE 3		ZONE 4		ZONE 5		CUMMULATIVE TOTAL	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
Purchased from hawkers	36	43.4	45	66.1	28	31.1	16	41	40	44.9	165	44.7
Obtain from my compound	14	16.7	7	10.3	12	13.3	17	43.6	15	16.9	65	17.6
Obtain from the urban fringe	6	2.2	15	22.1	35	38.9	6	15.4	18	20.2	80	21.7
Others	27	32.7	1	1.5	15	16.7	-	-	16	18	59	16.0
Total	83	100	68	100	90	100	39	100	89	100	369	100

Source: Field Survey, 2016

Table 5.13, shows that there were more edible trees than non-edible trees in all the zones. Edible trees had the highest percentage: 73%, 68%, 60.4%, 57%, 56.8% in zone 1, 2, 3, 4 and 5 respectively. This shows that the respondents preferred to plant edible trees that will provide fruits for them to non-edible trees that will only provide aesthetic value and shade for the compound.

Table 5.14 shows that 46.7% use firewood as a source of energy in cooking their food. While 42.2% goes for charcoal and 11.1% use planks. This trend was followed in all the zones as firewood had the highest percentages followed by charcoal and then planks. This shows that most of the respondents that are using fuel wood for cooking preferred firewood to other sources of energy.

Table 5.15 shows the sources of fuel wood that respondents used in cooking. It could be observed that the highest percentage of the respondents purchased their fuel wood from hawkers (66.1% in zone 2). Not many of the respondents obtained it from their compound except in zone 4 where 43.6% obtained it from their compounds. The highest percentage of those that obtained it directly from the urban fringe was 38.9% in zone 3. It was believed that only those that have access to cheap transportation or have their own vehicle usually go to the fringe because it was cheaper than buying from the hawkers in the town. The hawkers themselves confirmed that they got the fuel wood from the urban fringe and that they had to add the transport fare to the amount they bought it and their own profit for engaging in such business. From the above, it could be deduced that most of the fuel wood used in the city of Ado-Ekiti were obtained from the urban fringe.

Conclusion

Trees constitute an important part of nature and may symbolize personal, local, community and cultural meanings to people. They provide aestheticenjoyment and create a pleasant environment for different outdoor recreation activities. Trees also play a significant role in reducing erosion due to surface runoff and also in climate moderation. However, due to increasing urbanization, trees are being removed to make create space for construction which constitutes a dangerous trend. Wherever possible, trees should be planted to replace old ones and existing ones should be preserved due to their immense benefits.

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