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Determinants of tree-planting in a semi-urban community in south-western Nigeria

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Abstract

Without trees, human life would be unsustainable. Trees provide a wide range of products (timber, fruit, medicine, beverages, fodder and oils) and life-supporting services (carbon sequestration, erosion control, soil fertility, shade and beautification). However, our trees and forests are rapidly disappearing at an alarming rate with about 4 billion trees cut down annually and an inverse relationship to population growth. There is now an increasing need for renewal of our forest reserves, thereby necessitating sustenance through tree planting. This study set out to document the level of practice of tree planting in our community, the types of tree commonly planted ,purpose of planting such trees, and reason for not planting if any. This study employed a cross-sectional study design and was conducted at Ife central local government, Ile-Ife, Osun state. Respondents were selected with a multistage sampling technique and data collected with the use of interviewer administered questionnaires. Data were analysed at univariate and bivariate levels as appropriate. Land ownership was by 40% of respondents with 45% acquiring the land through family inheritance. Less than two-thirds (63%) had good knowledge of tree planting while only 45% had ever planted a tree. Trees that provide food or fruit were the most commonly planted (82%). Not owning a land was the major deterrent to planting a tree with marital status, occupation and land ownership significantly associated with tree planting ($p<0.05$). Provision of seedlings and review of land laws were ways the respondents felt Government could improve tree planting practice.

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Introduction

A tree is any tall, woody plant that has a single main stem with branches that extend outward or upward at a distance of 15 or 20 feet (5-7meters) above the ground (Anongo, 2012). The knowledge of how trees contribute to sustainable development is critical to forest renewal and human survival (Kwakwa and Wiafe, 2014; Boon *et al.*, 2009). Without trees, human life would be unsustainable. We need trees to be alive because our life depends on the availability of air, water and food (Verheij, 2004). Trees utilise carbon (iv) oxide, a green house gas in producing carbohydrate through photosynthesis and contribute to soil fertility that surpport variety of farming systems in practice. Trees provide a wide range of products (timber, fruit, medicine, beverages, fodder and oils) and life-supporting services (carbon sequestration, erosion control, wind shield, soil fertility, shade and beautification). The very soil we need to grow our food crops and the health of our water resources depend on the number of trees we have on the planet, and how healthy they are (Ogunkule and Oladele, 2004). And the livelihood of many people also depended on cultivation of economic trees to the rural poor and a source of energy.

However, our trees and forests are rapidly depleting at an alarming rate with an inverse relationship to population growth. There is an increasing need for renewal of our forest reserves, thereby necessitating sustenance through tree planting and agroforestry (Kwakwa and Wiafe, 2014; Sale and Olujobi, 2014).

Deforestation is the singular most important reason that we are experiencing ecological imbalances and contribute immensely to climate change. Global deforestation over the last two decades has resulted in the loss of million hectares of forests. Rising population has led to a decrease in open spaces and green belts in general. This is majorly due to the indiscriminate felling of trees. Therefore, we must replace the trees and forests previously decimated before it is too late. According to Professor Bruce Nelson of the University of Southern California, 'People who will not sustain trees will soon live in a world which cannot sustain people' (Oloyede 2008).

According to the Food and Agriculture Organisation (FAO), Nigeria has the world's highest deforestation rate estimated at 3.3%. Since 1990, the country has lost some 35.7% of its forest cover. Between 1990 and 2005, the country lost a staggering 79% of its forests and since 2000 Nigeria has been losing an average of 11 percent of its primary forests per year- this is double the rate in the 1990s. Revised fig.s from the FAO, between year 2000 and 2005, the country lost 55.7% of its primary forests (FAO, 2014 unpublished)

In sub Saharan Africa, countries are experiencing deforestation ocassioned by uncontrolled timber harvesting and exploitation, clearing of forests for farmlands and road contruction, including wild forest fire outbreaks, among others (Oeba, *et al*, 2012**)**. Therefore, the practice of planting trees in replacement of cut down trees is very low in Nigeria since for every 28 trees cut down, only one is replanted. Laws controlling the rate of trees cutting are also inadequate and not usually properly enforced (Aju and Popoola 2005).

There has been concerted efforts globally to promote and encourage governments to support tree planting while several tree planting projects have been launched in numerous developing countries. In Nigeria, the Federal and State governments have launched tree planting and afforestation programmes aimed at reversing the trend with several free tree seedlings giving to farms and people to aid afforestation. Despite these efforts, deforestation and desert encroachment remains and the effects of climate change and green house effect are evident in our environment.

Several studies had assessed tree planting in agro-forestry highlighting the economic values of tree planted (Aju and Popoola 2005; Chup 2004; Ogunkunle and Oladele 2004). However, in the

general population, few studies had documented knowledge and practice of tree planting and their determinants (Udofia 2010; Kobbail 2012)

This study assessed the determinants of tree planting, through the types of tree planted, the purpose of planting trees, and reason for not planting if any in the study area. The outcome of the study will provide guidelines to policy makers at all levels to plan programmes that will ensure sustainability of the natural vegetation aimed at providing a greener world. It also presents ares where advocacy could be channeled to promote tree planting culture among residents in the study area.

Materials and methods

Study design and location

This study employed a cross-sectional design and was conducted at Ife central local government area, Ile-Ife, Osun state. Ile-Ife is an ancient Yoruba city in south-western Nigeria located on coordinates 7°N 4.34°E and 7°N 4.5°E and about 218 kilometres northeast of Lagos. It occupies an area of 111km² and an estimated population of 167,254 according to the 2006 census (NPC,2009).

Study population and sampling issues

The study population were the residents of Ife central local government area (LGA). The sample size was estimated using the formula

$$N = \frac{z^2pq}{d^2}$$

(n= minimum sample size; z=standard normal variate =1.96 for 95% confidence level; p=prevalence of the attribute which is 50%; q=0.5; d=precision=0.05) which yielded a sample size of 384 respondents.

A multistage sampling technique was employed. There are eleven wards in Ife central LGA, of which five wards (Ilare ward 1, Ilare ward 3, Iremo ward 1, Iremo ward 5 and Moore/Ojaja ward) were randomly selected and in each ward, four streets were randomly picked from the list of streets. Thereafter, the study selected twenty houses per street using a systematic sampling technique. In each house, where occupied by multiple households, a household is selected by simple random sampling. A respondent who is above 18 years of age preferably head of household is selected.

Data collection

Data was collected with the use of a pretested interviewer administered questionnaire which consisted of questions on awareness about tree planting, attitude towards tree planting, knowledge about tree planting, practices of tree planting, benefits of tree planting and factors affecting tree planting.

In assessing the level of knowledge about tree planting a ten point scale was developed and good knowledge defined as respondents scoring between 7-10, fair knowledge scoring between 4-6 and poor knowledge, 3 and below.

Data analysis

Data was entered using statistical package for social sciences (SPSS) version 16.0. Appropriate descriptive and inferential statistics were employed in presenting results, with level of significance set at $p< 0.05$.

Ethical consideration

Verbal consent was obtained from the respondents prior to participation in the study by the interviewers and they were assured of confidentiality. Ethical approval was obtained from the Ethics committee of the Institute of Public Health.

Result

In this study, majority (45%) were aged between 21 and 30years while 20% were aged between 31 and 40 years old. Male respondents were 57% while female respondents were 43%. Over four-fifth of the respondents are Christians and over half are single. Over a third (35%) were students, 18% were traders while artisans were 17%. In addition, over 80% had at least secondary education (table 1).

Table 1. Socio-demographic characteristics of respondents.

Variable	Frequency (N=400)	Percentage
Age (years)		
≤ 20	57	14.2
21-30	181	45.2
31-40	83	20.8
41-50	30	7.5
>50	45	11.2
Missing	4	1.0
Sex		
Male	227	56.8
Female	173	43.2
Occupation		
Unemployed	1	0.3
Student	139	34.8
Artisan	68	17.0
Professional	51	12.8
Civil servant	57	14.2
Farmer	2	0.5
Trader	73	18.2
Missing	9	2.2
Religion		
Christianity	337	84.2
Islam	57	14.2
Traditional	5	1.3
None	1	0.3
Marital status		
Single	209	52.2
Married	187	46.8
Others	4	1.0
Education		
No education	5	1.3
Primary	38	9.5
Secondary	119	29.8
Tertiary	153	38.2
Postgraduate	85	21.2

The land occupied is owned by 40% of respondents with 45% of those owning land acquiring the land through family inheritance and about 30% through purchase (table 2).

Table 2. Ownership of land among the respondents.

Variable	Frequency (N=400)	Percentage
Ownership of land		
Yes	161	40.2
No	239	59.8
Acquisition of land		
Family inheritance	73	45.3
Leasehold	20	12.4
Government allocation	18	11.1
Outright purchase	50	31.2

Table 3 shows that awareness of tree planting is high among the respondents with about 88% having heard about tree planting. Radio and television were the predominant sources of information, accounting for 46% and 41% respectively. Less than a quarter (24%) respondents were aware of laws supporting tree planting. Replanting felled trees was the most reported law accounting for 33% while 15% of the respondents could not say which laws exactly and another 10% gave wrong responses.

Table 3. Awareness about tree planting.

Variable	Frequency (N=400)	Perce-ntage
Ever heard about tree planting		
Yes	353	88.2
No	47	11.8
Source of information		
Radio	184	46.0
Television	167	41.8
Newspaper	68	17.3
Friends	55	13.8
School	152	38.0
Others	29	7.4
Aware of law on tree planting		
Yes	97	24.2
No	303	75.8
Laws relating to tree planting known		
Knows law but could not say	14	15.4
Replanting felled trees	30	33.0

Variable	Frequency (N=400)	Perce-ntage
Forest reserve law	7	7.6
Deforestation/afforestation laws	24	26.4
Public health laws	2	2.1
Land use Act	5	5.5
Wrong response	9	10.0

Table 4 shows the attitude of respondents to tree planting. The study revealed that over 90% of respondents disagreed that tree planting was a waste of time or resources. Tree planting was reported to be beneficial to future generations by 93% of respondents while about 30% agreed that trees should only be planted by land owners. In addition, 87% of the respondents agreed that tree planting is a good land use while only 28% believe that it is a difficult process. Over 90% of the respondents agree that tree planting should not be left to Government alone but the responsibility of all.

Table 4. Attitude towards tree planting.

VARIABLE(N=400)	Strongly disagree (%)	Disagree (%)	Indifferent (%)	Agree (%)	Strongly agree (%)
Tree planting wastes time	245 (61.2)	117 (29.2)	7 (1.8)	20 (5.0)	11 (2.8)
Tree planting is a waste of resources	241 (60.2)	134 (33.5)	6 (1.5)	14 (3.5)	5 (1.2)
Tree planting is beneficial to future generations	7 (1.8)	9 (2.2)	11 (2.8)	148 (37.0)	225 (56.2)
Only land owners should plant trees	99 (24.8)	158 (39.5)	24 (6.0)	69 (17.2)	50 (12.5)
Trees should be planted in forest and not in houses	121 (30.2)	166 (41.5)	20 (5.0)	200 (50.0)	148 (37.0)
Tree planting is a good method of land use	9 (2.2) 405	21 (5.2)	22 (5.5)	200 (50.0)	148 (37.0)
Tree planting is difficult	73 (18.2)	169 (42.2)	47 (11.8)	86 (21.5)	25 (6.3)
Tree planting should be left to Government	203 (50.8)	160 (40.0)	9 (2.2)	15 (3.8)	13 (3.3)
Tree planting is the responsibility of all	10 (2.5)	25 (6.2)	14 (3.5)	149 (37.2)	202 (50.4)
Trees felled should be replaced	11 (2.8)	11 (2.8)	15 (3.8)	158 (39.5)	205 (51.3)

Table 5 shows that 63% of respondents' knew that tree could be planted by grafting while 88% knew that tree could be planted with seedlings. Only 63% are knowledgeable about the effect of tree felling on weather and 73% are able to link it to desert encroachment.

Knowledge of tree planting was high with 63% having a good knowledge about tree planting while 23% had a fair knowledge and 14% had a poor knowledge about tree planting (fig.1).

Table 5. Knowledge about tree planting.

Variable	Frequency (N=400)*	Percentage
Tree can be planted by grafting	252	63.0
Tree can be planted with seedlings	351	87.8
Trees are in discriminately felled in Nigeria	316	79.0
Tree felling is responsible for desert encroachment	291	72.8
Tree felling is linked with change in weather	250	62.5

*Multiple response questions.

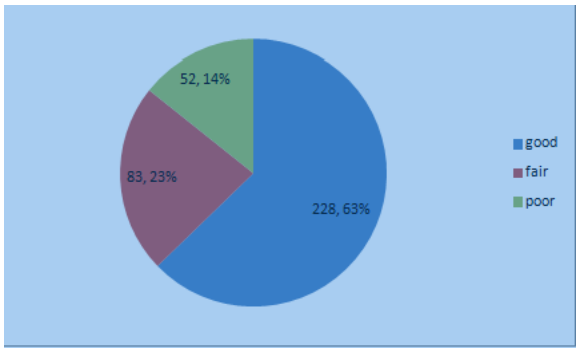

Fig. 1. Pie chart showing level of knowledge about tree planting.

Table 6 shows the practice of tree planting by respondents. Only 45% of respondents have ever planted a tree, however, about 84% said they would plant trees if conditions were right. About 82% of those who had planted trees planted fruit trees, while 24% planted cash crops, only about 12% planted shrubs. Reasons for planting tree was reported by respondents as a source of fruit and food (51.4%), shade (15%), aesthetic reasons (13%) and 9.5% to serve as wind breaker. About 37% of respondents did not plant trees because they did not have land, 17% because they had no interest, 12% because they didn't have time and 10% because they didn't know how.

Table 7 shows the awareness of respondents of the various benefits of tree planting. Beautification was almost universally reported as benefit of tree planting (99%). Among 97% of respondents its benefit as shade and source of livelihood were stated while only 27.5% stated decreasing global warming as a benefit and another 15% stating that it can increase spread of malaria.

Table 6. Practice of tree planting.

Variable	Frequency (N=400)	Percentage
Ever planted tree		
Yes	179	44.8
No	221	55.2
Intend to plant trees if conditions are right		
Yes	334	83.5
No	66	16.5
Type of tree planted (N=179)		
Fruit	146	81.6
Cash crop	43	24.0
Shrub	21	11.7
Others	8	4.5
Purpose of planting tree		
To serve as wind breaker	17	9.5
To serve as shade	27	15.1
Aesthetic reasons	23	12.8
To prevent erosion	8	4.5
During practical in school	3	1.7
As source of fruit or food	92	51.4
To provide fresh air	4	2.2
For personal benefits	3	1.7
Reasons for not planting trees		
No time	27	12.2
No interest	38	17.2
No resources	9	4.1
No land	81	36.7
No need	4	1.8
Not a farmer	10	4.5
Ignorance	22	9.9
No reason	5	2.3
No opportunity	10	4.5
Not my job	4	1.8

Table 7. Benefits of tree planting.

Variable	Frequency (N=400)	Percentage
Beautify surrounding	382	98.5
Serve as shade	391	97.8
Preserve the environment	387	96.8
Source of livelihood	360	90.0
Empowers people	105	26.2
Prevent erosion	330	82.5
Enriches the soil	328	82.0
Help plants and animal to thrive	358	89.5
Can decrease global warming	110	27.5
Can increase spread of malaria	58	14.5

Table 8 shows the various ways respondents felt government could encourage tree planting. Most reported measure was provision of seedling representing 50% while over a third suggested review of land laws and compensation of tree planters. Only 10% suggested punishment for those that do not plant trees.

Table 8. Ways in which Government can improve tree planting.

Variable	Frequency (N=400)	Perce-ntage
Provide seedlings	195	48.8
Review land laws	142	35.5
Compensate tree planters	140	35.0
Punish people who do not plant	41	10.2
Other ways	9	2.2

Table 9 shows that there is a significant relationship (p=0.047) between occupation and planting of tree as all of farmers planted tree compared to 35% of students, and about half of all other occupational groups.

Table 9. Relationship between occupation and tree planting.

	Ever planted tree		Statistic
Occupation	Yes (%)	No (%)	
Unemployed	1 (100)	0 (0)	
Student	49 (35.8)	88 (64.2)	χ^2 LR =12.7
Artisan	36 (52.9)	32 947.1)	P=0.047
Professional	24 (47.1)	27 (52.9)	
Civil servants	30 (52.6)	27 (47.4)	
Farmer	2 (100)	0 (0)	
Trader	33 (45.2)	40 (54.8)	

Table 10 shows a significant relationship (p<0.001) between marital status and tree planting as 60% of married people planted tree compared to just 35% of singles.

Table 11 shows a significant relationship (p<0.001) between ownership of land and tree planting as 65% of land owners planted tree compared to 32% of those who do not own land.

Table 10. Relationship between marital status and tree planting.

	Ever planted a tree		Statistic
Marital status	Yes (%)	No (%)	
Single	69 (33.2)	139 (66.8)	χ^2 LR=24.3
Married	107 (57.5)	79 (42.5)	P<0.001
Others	2 966.7)	1 (33.3)	

Table 11. Relationship between ownership of land and tree planting.

	Ever planted a tree		Statistic
Ownership of land	Yes (%)	No (%)	χ^2 LR=43.3
Yes	104 (64.6)	57 (35.4)	P<0.001
No	74 (31.4)	162 (68.6)	

Discussion

Tree planting is germane to sustenance of life and mitigating the consequences of environmental abuses. Our study found that only 45% of the respondents had ever planted a tree which is in agreement with a previous study by Ogunkunle and Oladele (2004), where about 42% had planted tree, but higher than 15% reported by Kwakwa and Wiafe (2014) in Ghana. This difference could be attributed to the fact that the Ghana study was done in a rural setting compared to the semi-urban setting in our study and that of Ogunkunle and Oladele (2004). The low participation in tree planting in our study and that of Ogunkunle's could have arisen because majority of the respondents had no land, no interest in tree planting, lack knowledge and probably because of their occupation. Kwakwa and Wiafe (2014) also reported lack of knowledge of benefit of trees as a factor while lack of knowledge about the economic benefits derivable from tree planting and ownership could also be advocated (Sale and Olujobi, 2014). However, a handful of this category of people was ready to engage in active tree planting exercise if provided with necessary support and encouragement.

It was found that mass media is an effective means of disseminating information about tree planting as majority of our respondents got their information from this source unlike reports by Udofia, 2010 and Kobbail, 2012 where indigenous knowledge was cited as the main source of knowledge. This contrast could be explained by the fact that majority of our respondents, being students are more likely exposed to mass media as means of obtaining information. Also, this can be attributed to the fact that mass media is a cheap and readily available source of information.

Attitude of most respondents revealed that they agreed that tree planting was a useful practice, a good way of using resources and also beneficial for future generation. This was also supported by Kobbail, 2012 in his study that identified tree planting as valuable, and not a waste of time. Many were aware of the multipurpose benefits of trees such as aesthetic uses, shade for relaxation, preservation of environment, source of livelihood and also a component of agroforestry, among others. On the issue of tree replenishment, majority felt that every tree felled should be replaced by planting another tree, in line with previous advocacy about "cut one, plant one" campaign (Anon 1991), but this seems not to have firm in Nigeria despite government awareness creation, justifying tree planting. In this regard, Nigeria still has the highest deforestation rate worldwide, thereby increasing desert encroachment especially in Northern part of the country is happening at an alarming magnitude.

The reasons while those that planted trees were because they serve as a source of food or fruits while others planted for shade, aesthetic reasons and wind breaker. This is buttressed by the findings of Ogunkunle and Oladele, 2004; Anongo, 2012; and Kwakwa and Wiafe, 2014, which revealed that majority of those that planted tree did so as source of food/fruits while others planted for firewood and shade. The authors established that some of his respondents had erroneous belief that trees grow on their own without any effort and therefore preferred to grow fruit trees which were thought to be more beneficial and economical rewarding. This showed that food is the most important reason for planting trees in this environment.

Going by our findings, lack of land ownership is a major reason why people do not plant trees in this environment. It is almost impossible to invest in leased land, where lessors have absolute controlat the expiration of the lease agreement. Most (65%) of our respondents who owned lands engaged in tree planting. This was supported by a study by Clement and Amezaga, 2009 study. According to him, most respondents claimed land owners restricted them from planting. This also reveals that accessibility to land and its resources to a large extent, is a major contributory factor to tree planting. Married people were more involved in tree planting from our study. This is probably due to the fact that more married people have their own houses and hence are more likely to own lands more than singles. This is supported by the work of Udofia, 2010 that documented the positive role of women in tree planting.

Our study also revealed that occupation plays an important role in tree planting as all (100%) farmer respondents planted trees as opposed to professionals and civil servants. Most civil servants lacked the motivation to plant trees. This is in keeping with findings from a previous study by Chup, 2004 which showed that more farmers planted trees as they were fully aware of the importance of forest and forest products in the daily life of farmers, which encouraged them to participate in community agroforestry activities.

From our study, despite government sensitization programme on tree planting and afforestation, the awareness of respondents about existing laws on tree planting was low. This could be a reason for the low

practice of tree planting and is an area where government could do more to improve tree planting.

Conclusion

Most people are aware of tree planting mainly from electronic media although, few are aware of the laws guiding tree planting and felling. Knowledge of tree planting is good but this has not translated to practice. The major determinants of tree planting are ownership of land and being married. Fruit tree is the commonest tree planted and most respondents believe that supply of seedlings by government can improve tree planting.

References

Aju PC, Popoola L. 2005. Trees in the traditional farming systems in southeastern Nigeria a case study of Imo state. Journal of Environmental Extension **5**, 25-31

Anon. 1991. Nigeria's threatened environment: A National profile. National Environment Study/Action Team (NEST) Ibadan, Nigeria

Anongo MC. 2012. Think globally, act locally (2): Tree-planting in Nigeria-whose responsibilities. Archives of Applied Science Research **4**, 1423-1431

Boon E, Ahenkan A, Badoun N. 2009. An assessment of forest resource policy and management in Ghana. IAIA09 Conference Proceedings, Impact Assessment and Human Well-Being 29th Annual Conference of the International Association for Impact Assessment, 16-22 May, Accra International Conference Center, Accra, Ghana.

Chup CD. 2004. Analysis of Agro forestry Practices in the Guinea Savannah Ecological Zone: A Case Study of the Federal Capital Territory of Nigeria. PhD thesis, University of Jos, Nigeria, 43-65

Clement F, Amezaga JM. 2009. Afforestation and forestry land allocation in Northern Vietnam: Analysing the gap between policy intentions and outcomes. Land Use Policy, **26**, 458-470

Kobbail AAR. 2012. Local peoples attitude towards community forestry practices. A case study of Kosti province- central Sudan International Journal of Forest Research doi.org/10.1155/201/652693

Kwakwa PA, Wiafe ED, Alhassan H. 2014. I use firewood but I do not grow trees: An analysis of tree planting exercise among rural households in Ghana. Asian Bulletin of Energy Economics and Technology **1**,7-12

Oeba VO, Otor SCJ, Kung'u JB, Muchiri MN. 2012. Modelling Determinants of Tree Planting and Retention on Farm for Improvement of Forest Cover in Central Kenya. International Scholarly Research Network. Volume 2012, doi:10.5402/2012/867249.

Ogunkunle ATJ, Oladele FA. 2004. Ethno botanical study of fuelwood and timber wood consumption and replenishment in Ogbomosho, Oyo state, Nigeria. Environmental Monitoring and Assessment **91**,223-226.

Oloyede IO. 2008. Afforestation and Reforestation: The Unilorin Experiment. A presentation at the high level technical workshop on afforestation and climate change in Africa. p 23.

Sale FA, Olujobi OJ. 2014. Farmers perception of opportunities Preferences and obstacles of growing multipurpose trees on farmland in kogi state. European Scientific Journal **10**, 607-617.

Udofia SI. 2010. Gender Roles and Sources of Knowledge of Home garden Management in Akwa Ibom State, Nigeria. Nigerian Journal of Agriculture, Food and Environment **6**, 47-52

Verheij E. 2004. Propagating and planting trees. Agrodok, Agrodok 19. Agromisa/CTA, Wageningen, The Netherlands.