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## Willingness of Park Users to Plant Trees in Public Motor Parks to Improve Environmental Condition in Ibadan Metropolis, Oyo State, Nigeria

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**ABSTRACT:** The effect of global warming and air pollution have shifted more focus to tree planting as a way to combat climate change and improve the environment. Most Nigerian motor parks are polluted; thus, this study investigated the willingness of park users to plant trees in public motor parks to improve park's environmental condition in Ibadan Metropolis, Oyo State, Nigeria using structured questionnaires in six motor parks. Questionnaires were randomly administered to 12 drivers, 5 traders and 3 commuters, per Motor Park, making a total of 120 respondents. Study revealed that 60.8% of motor park users were under the age of 50; 100% of drivers were men, whereas women (70%) dominated trading. Drivers (94.4%) and traders (83.3%) use motor parks on a daily basis, but commuters (66.7%) use the park occasionally. Most of respondents (47.2%), traders (56.7%), and commuters (83.3%) stated that the park's environment is not conducive (unsuitable). Respondents (85.8%) of motor park users indicated that they want a better environmental condition. Chi-square test reveals a significant relationship between respondents' educational status and perceived environmental condition of the motor park. Logistic analysis indicated that traders (0.183) and commuters (0.236) are less likely to be interested in tree planting. Most Nigerian motor parks have unsuitable environments, tree planting is one potential solution for improving the environmental condition. Relevant authorities should develop policies that encourage tree planting and tree planting should be incorporated and implemented in the design of new motor parks.

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Concerns about global warming, urban heat, and air pollution from industry and vehicles, among other things, have shifted attention to tree planting as a means of improving the climate and conserving energy (Fasoro and Ajewole, 2022). Neirotti *et al.* (2014) affirmed that as the world's population grows, cities become increasingly complex, with a high number of interconnected citizens, businesses, modes of transportation, communication networks, services, and utilities. Thus, environmental pollution has increased drastically over time. Many of Nigerian motor parks

are not properly and systematically laid out, the layouts are poorly planned, and trees are rarely found in the parks. The motor parks are disorganized and densely populated, with commercial activities distinguishable by the efforts of people providing goods and services. Vehicle horns, running automobile engines, the use of generators, faulty exhaust pipes, unsanitary waste disposal by motor park users, megaphone speakers used to attract commuters, and other unregulated activities. As a result, the temperatures in the parking lots are higher than in the

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surrounding neighborhoods. Carbon dioxide emissions from fossil-fuel power plants would rise in such a scenario, as would unhealthy ozone layers, pollution, discomfort, and disease. Because these motor parks are perpetually polluted, they have a negative impact on the environment, people, and property. Adeponle (2013) stated that green areas are visible in Nigerian city plans and designs, but they are rarely implemented in the development of cities throughout the country. Trees in public places are primarily the responsibility of state and local governments, whereas private individuals are responsible for maintaining green spaces in their homes. State governments are responsible for motor parks, which are supervised by the National Union of Road Transport Workers (NURTW). The union is an independent Nigerian trade union that serves the interests of road transport workers by advocating for collective bargaining and social stability for all transport workers, as defined in its constitution. Thus, there is an overwhelming need to prioritize well-maintained and tranquil motor parks on the 'must-do-list' of government and the union because a conducive environment is essential for human well-being. Studies have shown that trees can intercept pollution, lower local temperatures, store carbon dioxide, retain excess rainfall, and reduce energy demand while also providing shade for people and wildlife. In this regard, planting trees in the motor parks can prevent human exposure to particulate matter (dust), ammonia (NH<sub>3</sub>), carbon dioxide (CO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), ozone (O<sub>3</sub>), particulate matter (PM; dust) and sulphur dioxide (SO<sub>2</sub>) from the air (Kah *et al.*, 2021; Ajakaiye and Agunloye, 2020; Ahmed, 2016 and Ademowo,

2015). This study therefore investigated the willingness of park users to plant trees in public motor parks to improve parks' environmental condition in Ibadan Metropolis, Oyo State, Nigeria.

**MATERIALS AND METHODS**

*Study Area:* Ibadan is the capital of Oyo State, Nigeria. In south western part of Nigeria, Ibadan is located between Latitude 7.447798°N and 7.428421°N; and Longitude 3.881572°E and 3.893378°E. Ibadan was founded in 1829 and is Nigeria's largest city, as well as the third most populous after Lagos and Kano. According to the NBS (2015), Ibadan has a population of 3,160,200 and it is located 128 kilometers inland northeast of Lagos and 530 kilometers southwest of Abuja.

*Data Collection Procedure:* The names of registered public motor parks in Ibadan metropolis were obtained from National Union Road Transport Workers Secretariat, Ojoo, Ibadan. Ten registered motor parks were identified namely: Ojoo, Idi-iroko, Molete, New garage, Gate, Sango, Egbeda, Challenge, Dugbe and Apata Motor Parks. Six motor parks were purposively selected based on the presence of the designated size of the park. The selected motor parks were Ojoo motor park, Sango motor park, Idi-iroko motor park, New garage motor park, Molete motor park and Gate motor park. Figure 1 and Table 1 respectively show the selected motor parks on the map and the coordinates on the study area.

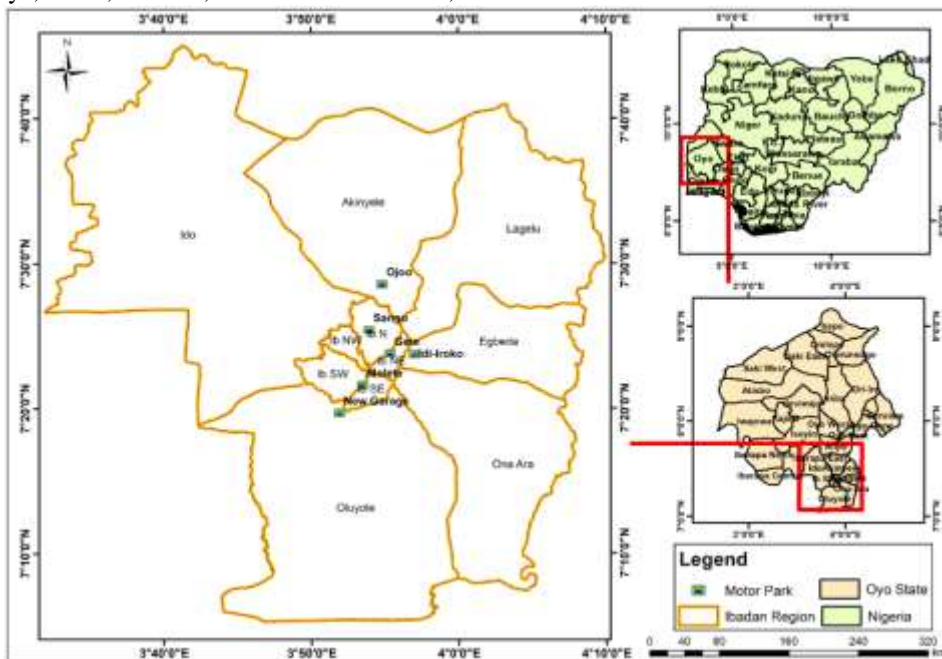


Fig 1: Map of Ibadan showing the Motor Parks

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**Table 1: The Coordinates of the Motor Parks**

Motor parks	Latitude	Longitude
Ojoo motor park	7° 46' 76"N - 7° 46' 78"N	3° 91' 29"E - 3° 91' 36"E
Sango motor park	7° 42' 31"N - 7° 42' 36"N	3° 89' 90"E - 3° 89' 92"E
Molete motor park	7° 35' 86"N - 7°35' 92"N	3° 88' 83"E - 3° 88' 97"E
New garage motor park	7° 32' 44"N - 7° 32' 95"N	3° 86' 54"E - 3° 88' 97"E
Idi- iroko motor park	7° 38' 47"N - 7° 39' 78"N	3° 93' 67"E - 3° 98' 14"E
Gate motor park	7° 39' 37"N - 7° 39' 73"N	3° 92' 08"E - 3° 92' 79"E

$$Y = \frac{\exp (b_0 + b_1 X_1 + \dots + b_n X_n)}{1 + \exp (b_0 + b_1 X_1 + \dots + b_n X_n)} \quad (1)$$

Where Y = dependent variable (willingness to plant trees); X = Independent variable (motor park users, gender, age and educational background); B<sub>0</sub> = constant; e = exponential

*Data Analysis:* Structured questionnaires were randomly administered to twelve (12) drivers, five (5) traders and three (3) commuters making 20 respondents in each Motor Park, making a total of 120 respondents. Descriptive statistics, chi square, and logistic regression were used to analyze the data. Logistic regression was used to identify the factors that influence public motor park users' willingness to plant trees in the parks.

**RESULTS AND DISCUSSION**

*Demographic Characteristics of Motor Park Users:* Table 2 shows the demographic characteristics of private forest plantation owners, such as age, gender, occupation, and educational status, as well as the year(s) they visited the motor parks. According to the table, most of the drivers (36.1%) were between the ages of 40 and 49; 53.3% of traders were below the ages of 40; and 33.3% of commuters were between the ages of 50 and 59. In the motor parks, all of the drivers (100%) were men, while 70% of the traders and 61.1% of the commuters were women. Drivers (73.6%), traders (66.7%), and 88.9% of commuters had some form of education.

For drivers in motor parks, 34.7% claimed to have worked in the motor parks for less than 5 years, followed by those (27.8%) who claimed to have worked in the parks for 6 to 10 years. Traders, 36.7% of respondents stated that they have been trading in the motor parks for 16 to 20 years, and 23.3% stated that they have not traded in the motor parks for more than five years. The table also revealed that 27.8% of commuters have used the motor parks between 11 and 15 years, followed by those (22.2%) who have used the motor park between 21 and 25 years. The study showed that 60.8% of motor park users are under the age of 50. This demonstrates that many people have both obligations and responsibilities to provide for themselves and their families, necessitating the need to

move in, out, and around cities via transportation terminal points (motor parks) to meet their daily needs and improve their standard of living. Given the long hours and stress of daily travel within and outside of the city, it is not surprising that all of the drivers in the motor parks were men. Similarly, when it came to trading, most of the respondents were women. World Bank (2013) affirmed that women play an important role in African trade: they transport goods across borders, produce products, especially food, that can be exported, and own and manage trade-oriented firms.

*The Rate of Use of The Motor Parks by Respondents:* Motor parks are used on a daily basis by 94.4% of drivers and 83.3% of traders, according to Table 3. However, 66.7% of commuters claimed they use the motor parks on occasion. A Pearson's chi-squared test was used to determine whether some socioeconomic characteristics of respondents, such as gender, age, and educational status, and the rate of use of motor parks, were related. The results showed significant relationship between gender {χ<sup>2</sup> (3) = 22.705, p<0.001}; and education status (χ<sup>2</sup> (9) = 38.446, p<0.001} and the rate of use of the motor parks. However, there is no significant relationship between the rate of park use and the respondents' age {χ<sup>2</sup> (12) = 10.376, p>0.001}. Obviously, the drivers and traders are the ones that utilize the motor park on a daily basis because driving cars or buses is their main source of income. Similarly, traders sell goods to customers within and outside the motor park. Although some commuters travel on a weekly basis and have made the motor park their preferred location to board vehicles to their destinations, a larger percentage claimed they only travel when necessary.

*Perceptions of Respondents on The Environmental Condition of the Motor Park:* Environmental condition of the motor park is critical for human well-being. From Figure 2, drivers (47.2%) reported that the environment is not conducive (unsuitable), 38.9% claimed the environment is good (suitable) and 13.9% affirmed that the environment is fair (relatively suitable). Twenty percent of the traders stated that the environment is fair (relatively suitable), 56.7%

reported that the environment is not conducive (unsuitable) and 23.3% iterated that the environment is good (suitable). Commuters (11.1%, 83.3% and 5.6% respectively) stated that the motor park environment is fair (relatively suitable), not conducive (unsuitable) and good (suitable). Pearson's chi-squared test reveals that gender has no significant relationship  $\{\chi^2 (2) = 2.348, p>0.001\}$ , age  $\{\chi^2 (8) = 16.522, p>0.001\}$  with the perceived environmental condition of the motor parks. However, there is a significant relationship between perceived environmental condition of the

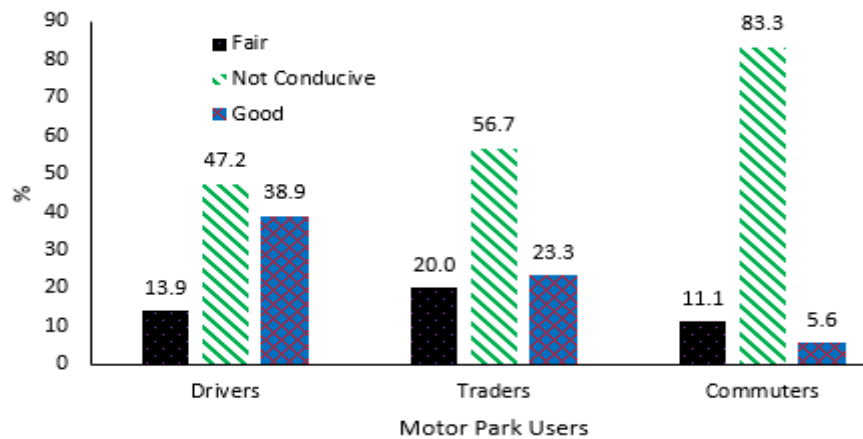
motor park and the respondents' educational status  $\{\chi^2 (6) = 116.215, p<0.001\}$ . Keles (2011) reported that one of the most important components of life quality has always been environmental quality. However, evaluating values such as beauty, fresh air, noise, fumes, and congestion is difficult because people are not very specific about their likes and dislikes. Thus, the perception of motor park users about the park's environmental condition can only be investigated.

**Table 2:** Frequency Distribution of Motor Park Users by Socioeconomic Characteristics

Demographic characteristics		Motor Park Users			Total
		Drivers % n=72	Traders % n=30	Commuters % n=18	% n=120
Age	≤39	19.4	53.3	33.3	30.0
	40-49	36.1	23.3	22.2	30.8
	50-59	30.6	16.7	33.3	27.5
	60-69	12.5	6.7	5.6	10.0
	≥70	1.4	0	5.6	1.7
Gender	Male	100.0	30.0	38.9	73.3
	Female	0	70.0	61.1	26.7
Educational status	No formal education	26.4	33.3	11.1	25.8
	Primary	25.0	33.3	38.9	29.2
	Secondary	27.8	16.7	5.6	21.7
	Tertiary	20.8	16.7	44.4	23.3
Number of Years that respondents have used the Park	First time	0	0	11.1	1.7
	≤5	34.7	23.3	16.7	29.2
	6-10	27.8	16.7	5.6	21.7
	11-15	18.1	13.3	27.8	18.3
	16-20	11.1	36.7	5.6	16.7
	21-25	5.6	6.7	22.2	8.3
	≥26	2.8	3.3	11.1	4.2

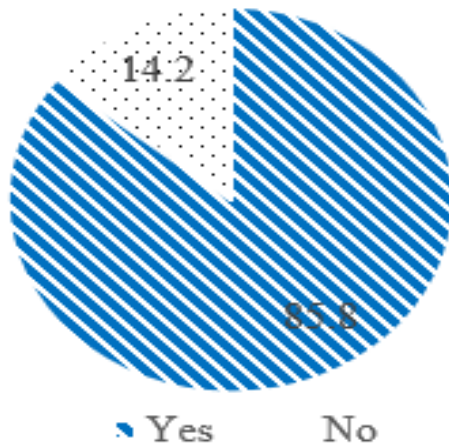
**Table 3:** Frequency Distribution of Rate of Use of the Motor Parks by Respondents

Rate of Park Use	Motor Park Users			Total
	Drivers (%) n=72	Traders (%) n=30	Commuters (%) n=18	n=120
Daily	94.4	83.3	5.6	78.3
Weekly	5.6	3.3	16.7	6.7
Monthly	0	0	11.1	1.7
Occasionally	0	13.3	66.7	13.3



**Fig 2:** Percentage Distribution of Respondents' Perceptions of the Motor Park's Environmental Quality

*Desire to Improve Motor Park Environment Through Tree Planting:* Since most of the motor park users stated that the environment is unfavorable, it is necessary to confirm if they desire improvement, which will increase their willingness to participate in any solution provided to reduce pollution in the environment. Figure 3 showed that 85.8% of motor park users indicated that they want a better environmental condition for the motor park.

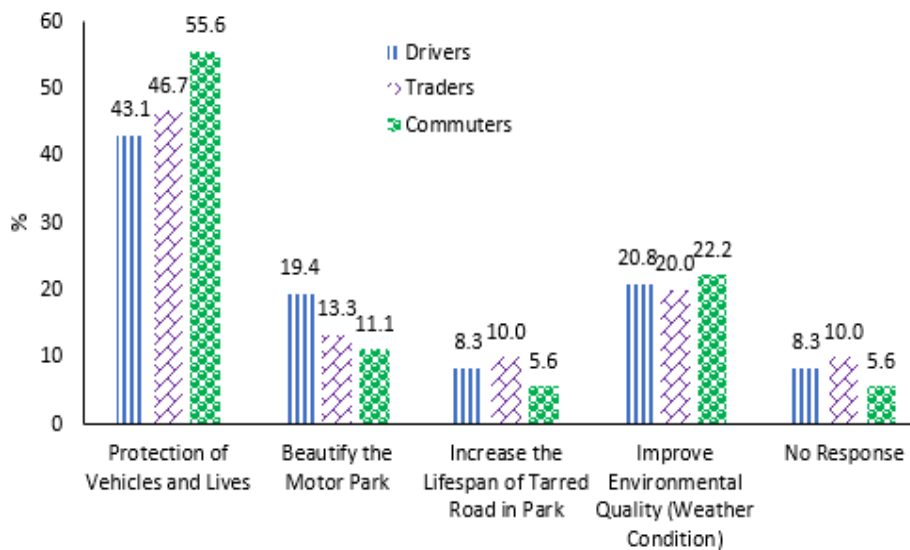


**Fig 3:** Percentage Distribution of Respondents Desire for Better Environmental Condition

*Potential motor park tree services:* The perceptions of public users on the potential services that trees can provide for motor parks were investigated to determine whether motor park users recognize trees as an important component of motor park social-ecological

systems. From Figure 4, 43.1% of drivers, 46.7% of traders, and 55.6% of commuters believe that trees in the motor park can protect vehicles and lives from erosion, wind, storms etc. The ability of trees to improve the environmental quality of motor parks was also identified by the respondents (drivers, 20.8 percent; traders, 20%; and commuters, 22.2%).

*Willingness of Motor Park Users to Plant Trees:* A logistic regression analysis was performed to determine the impact of some socioeconomic variables on motor park users' willingness to participate in tree planting. Motor park users, gender, age, and educational background are among the independent variables. According to Table 4 shows, there is no significant relationship between motor park users, gender, age, and willingness to participate in tree planting to rehabilitate the motor parks. By factors of 0.183 and 0.236 respectively, traders and commuters are less likely to participate in tree planting. Female Motor Park users are 0.220 less likely to participate in tree planting, and the odds of respondents participating decrease by 0.929 for each year of age. However, there is a significant relationship between motor park users' educational backgrounds and their willingness to participate in tree planting to help rehabilitate the parks. Motor park users with secondary and tertiary education are 9.253 and 2.347 times more likely to participate in tree planting, respectively. The study revealed that drivers are more likely to plant trees to rehabilitate the motor parks because they rely on the park for a living and spend more hours and years there than other users.



**Fig 4:** Percentage Distribution of Services Trees can provide

**Table 4:** Willingness of Motor Park Users' Participation in Tree Planting

Variables	B	S.E	Wald	df	Sig.	Exp(B)
Traders	-1.700	0.804	4.464	1	0.035	0.183
Commuters	-1.442	0.804	3.215	1	0.073	0.236
Female	-1.514	0.766	3.905	1	0.048	0.220
Age	-0.073	0.243	0.090	1	0.764	0.929
Primary	0.296	0.773	0.147	1	0.701	0.743
Secondary	2.225	0.737	9.119	1	0.003**	9.253
Tertiary	0.853	0.773	1.219	1	0.270	2.347
Constant	0.897	0.814	1.214	1	0.270	2.453

*Conclusion:* Most of Nigerian motor parks have unsuitable environments due to pollution, traffic congestion, and various types of chaos. Tree planting, which has numerous ecosystem benefits, is one potential solution for improving the environmental condition of the motor park and thus the quality of life. In order to improve the environment, relevant authorities must develop policies that encourage the planting of amenity trees in motor parks, and tree planting should be incorporated and implemented in the design of new motor parks in the future.

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