

Spatial Distribution, User Characteristics and Ecosystem Services of Recreational Facilities in Federal Capital Territory, Abuja, Nigeria

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Publication Date: 2026/08/18

Abstract: Urban recreational facilities are critical components of sustainable city development, providing essential services that enhance human well-being, promote social cohesion, and deliver key ecosystem benefits such as climate regulation, biodiversity conservation, and air purification. Despite their importance, limited attention has been given to the integrated assessment of their spatial distribution, user characteristics, and ecosystem service functions, particularly in rapidly growing cities of developing countries. This study examines recreational facilities in the Federal Capital Territory (FCT), Abuja, Nigeria, with the aim of evaluating their spatial usage patterns, socio-demographic characteristics of users, recreational behaviours, and perceived ecosystem service contributions. A mixed-methods approach was adopted, combining quantitative surveys of 462 park users with qualitative data from key informant interviews and focus group discussions. Data were collected through questionnaires, field observations, and stakeholder engagements across identified recreational parks in Abuja. Descriptive statistical techniques were used to analyze quantitative data, while qualitative responses were thematically analyzed to provide contextual insights. Findings reveal distinct functional and demographic differentiation among park types. Large Formal Parks serve a diverse population with emphasis on exercise, environmental education, and passive recreation; Neighborhood Parks function as essential community-based spaces for daily use, nature appreciation, and family interaction; while Commercial/Amusement Parks are predominantly youth-oriented, event-driven leisure spaces. Across all park types, users are generally well-educated, with varying income, occupational, and marital profiles shaping patterns of visitation and use. The study further shows that recreational parks in Abuja provide significant perceived ecosystem services, particularly in relation to mental health support, aesthetic improvement, and climate regulation. However, awareness of regulating ecosystem services such as water management and biodiversity conservation remains limited. Visitation patterns also reveal spatial and temporal inequalities, with peak use occurring during weekends and festive periods, and evidence of uneven access and infrastructure quality across park categories. The study concludes that recreational facilities in Abuja play a vital socio-ecological role but are constrained by spatial inequality, infrastructure deficits, and limited public understanding of their full environmental value. It recommends differentiated park management strategies, improved infrastructure investment, enhanced environmental education, and strengthened urban planning integration to promote equitable access and long-term sustainability of recreational ecosystems in the city.

Keywords: Urban Recreational Facilities; Spatial Distribution; Ecosystem Services; Park Users; Environmental Sustainability.

How to Cite: Maigida S. Abba; Edicha Jibrin A.; Adekiya Oyelayo A.; Oludele J. Ayoola (2026) Spatial Distribution, User Characteristics and Ecosystem Services of Recreational Facilities in Federal Capital Territory, Abuja, Nigeria. *International Journal of Innovative Science and Research Technology*, 11(7), 3776-3788. <https://doi.org/10.38124/ijisrt/26jul1037>

I. INTRODUCTION

Urban recreational facilities constitute an essential component of sustainable urban development, providing opportunities for leisure, physical exercise, tourism, environmental education, and social interaction. These facilities, which include parks, gardens, resorts, amusement centres, wildlife parks, sports complexes, and recreational green spaces, contribute significantly to the quality of life and well-being of urban residents. Beyond their social and

economic functions, recreational facilities also provide valuable ecosystem services such as climate regulation, biodiversity conservation, carbon sequestration, air purification, storm water management, and aesthetic enhancement (Chiesura, 2004; Millennium Ecosystem Assessment, 2005). The rapid growth of urban populations worldwide has increased the demand for recreational spaces and associated ecosystem services. The United Nations projects that nearly 68% of the world's population will reside in urban areas by 2050, creating significant pressure on urban

infrastructure and environmental resources (United Nations, 2019). In response, urban planners and environmental managers have increasingly recognized the importance of recreational facilities as critical elements of sustainable cities. Well-distributed recreational facilities improve public health, foster social cohesion, promote environmental awareness, and enhance urban resilience against environmental challenges such as heat islands, flooding, and air pollution (Kabisch et al., 2017).

In developing countries, however, the provision and management of recreational facilities often face challenges arising from rapid urbanization, inadequate planning, population growth, and competing land-use demands. These challenges frequently result in uneven spatial distribution of recreational facilities, limiting accessibility for certain population groups and reducing the effectiveness of ecosystem service delivery. The spatial location of recreational facilities plays a crucial role in determining their accessibility, utilization, and contribution to environmental sustainability. Geographic Information Systems (GIS) and spatial analysis techniques have therefore become important tools for evaluating the distribution and accessibility of recreational facilities and supporting evidence-based urban planning decisions (Talen, 2003).

The Federal Capital Territory (FCT), Abuja, Nigeria's administrative capital, has experienced rapid urban expansion since its establishment in 1976. The city's increasing population and physical development have generated growing demand for recreational facilities to meet the social, economic, and environmental needs of residents and visitors. Abuja hosts a variety of recreational facilities, including urban parks, gardens, resorts, recreational centres, and nature-based attractions that contribute to tourism development, economic growth, and environmental sustainability. Despite these contributions, concerns remain regarding the adequacy, accessibility, spatial distribution, and ecosystem service functions of these facilities across the territory. Furthermore, user characteristics such as age, gender, income level, educational attainment, occupation, and recreational preferences influence the utilization patterns and perceived benefits of recreational facilities. Another significant challenge is the limited understanding of the ecosystem services provided by recreational facilities in the FCT. While these facilities contribute to environmental sustainability through functions such as air purification, temperature regulation, carbon storage, stormwater control, and biodiversity support, these benefits are rarely quantified or incorporated into urban planning and management decisions. Consequently, the environmental value of recreational facilities may be underestimated, leading to inadequate protection and investment.

Previous studies in Nigeria have largely focused on the economic, tourism, and recreational aspects of urban parks and recreational centres, with limited attention given to their spatial distribution and ecosystem service contributions. The absence of integrated studies combining spatial analysis, user characteristics, and ecosystem service assessment creates a knowledge gap that hinders effective planning and sustainable management of recreational facilities within the Federal Capital Territory. Given the increasing importance of recreational facilities in promoting environmental sustainability and human well-being, there is a need for a comprehensive assessment of their spatial distribution, user characteristics, and ecosystem service contributions within the Federal Capital Territory, Abuja. Such information will provide valuable insights for urban planning, environmental management, and policy formulation aimed at enhancing the sustainability and inclusiveness of recreational infrastructure in the city.

II. MATERIALS AND METHODS

➤ Study Area

The first development phase (often referred to as Phase One) of the Federal Capital City, Abuja, constitutes the location for this study. The FCC is located at 8°25" and 9°25" North of the Equator and 6° 45" and 7° 45" east of Greenwich as shown in Figure 3.1. The Abuja Master Plan was designed to have four phases of development, each of which would consist of a specific number of districts (Ezeamaka & Oluwole, 2016). The Federal Capital City (FCC) is in the FCT's Northeast corner (Fanan et al., 2011), and according to (Mabogunje, 1976), this area is regarded as the most suitable and favourable for human habitation and settlement development in the FCT.

The city serves as the capital and the location of the government's administrative headquarters, including all extra-ministerial agencies and government parastatals. Administratively, the FCC is located within the Abuja Municipal Area Council (AMAC), one of the six (6) area councils in the Federal Capital Territory (FCT). The AMAC is located on the eastern wing of the Federal Capital Territory. It covers an area that spans 1,769 km² out of the 8,000 km² land mass of the FCT. The estimated 2018 population of AMAC was 2,440,200. Phase One of the FCC is made up of ten (10) districts that jointly occupy an area that measures about 69.9 km². The constituent districts of Phase One of the FCC include Central Business District (A00), Garki I (A02), Wuse I (A02), Garki II (A03), Asokoro (A04), Maitama I (A05), Maitama II (A06), Wuse IIA (A07), Wuse IIB (A08), Guzape (A09).

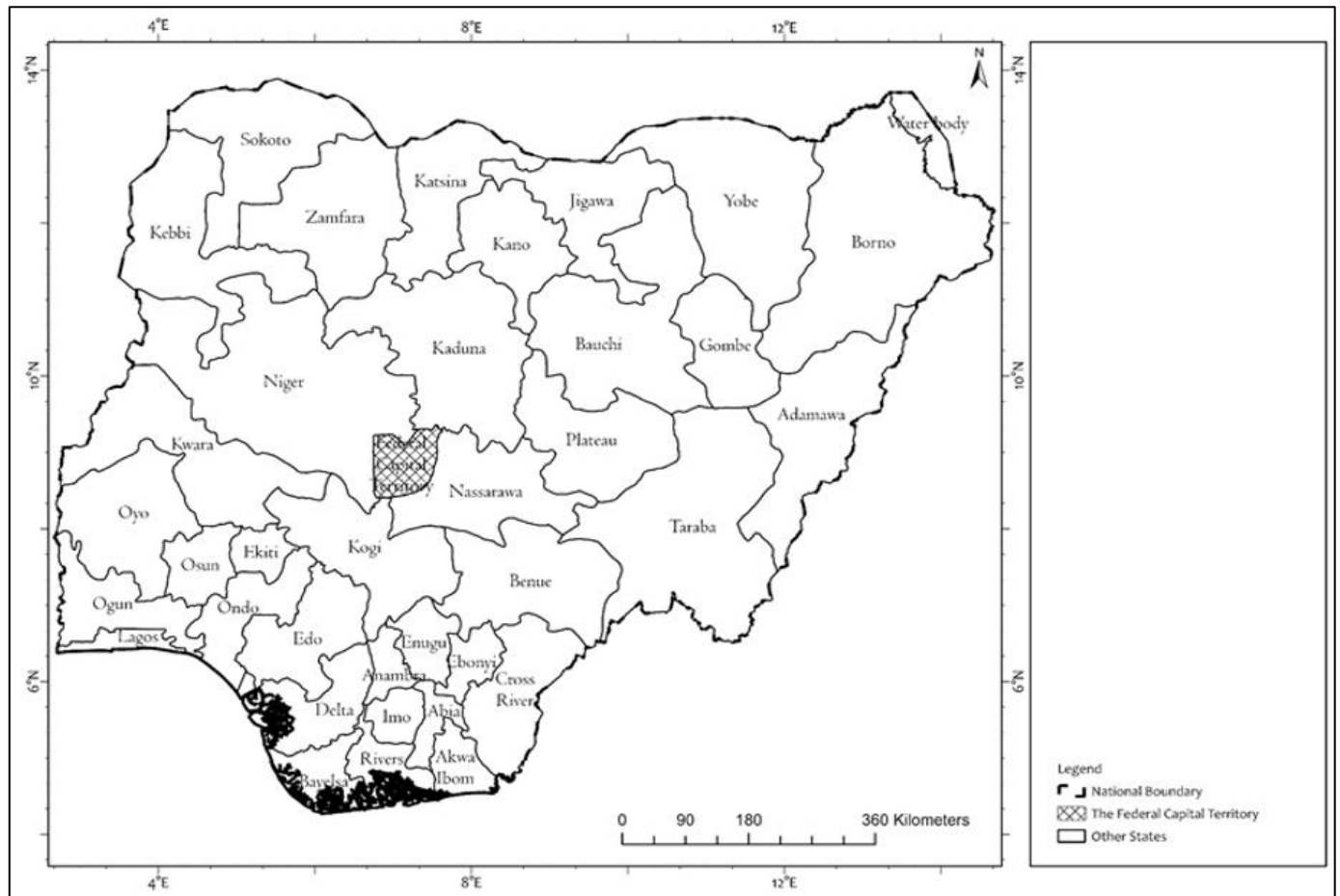


Fig 1 Map of Nigeria Showing FCT
Source: FCDA, Cartography Department.

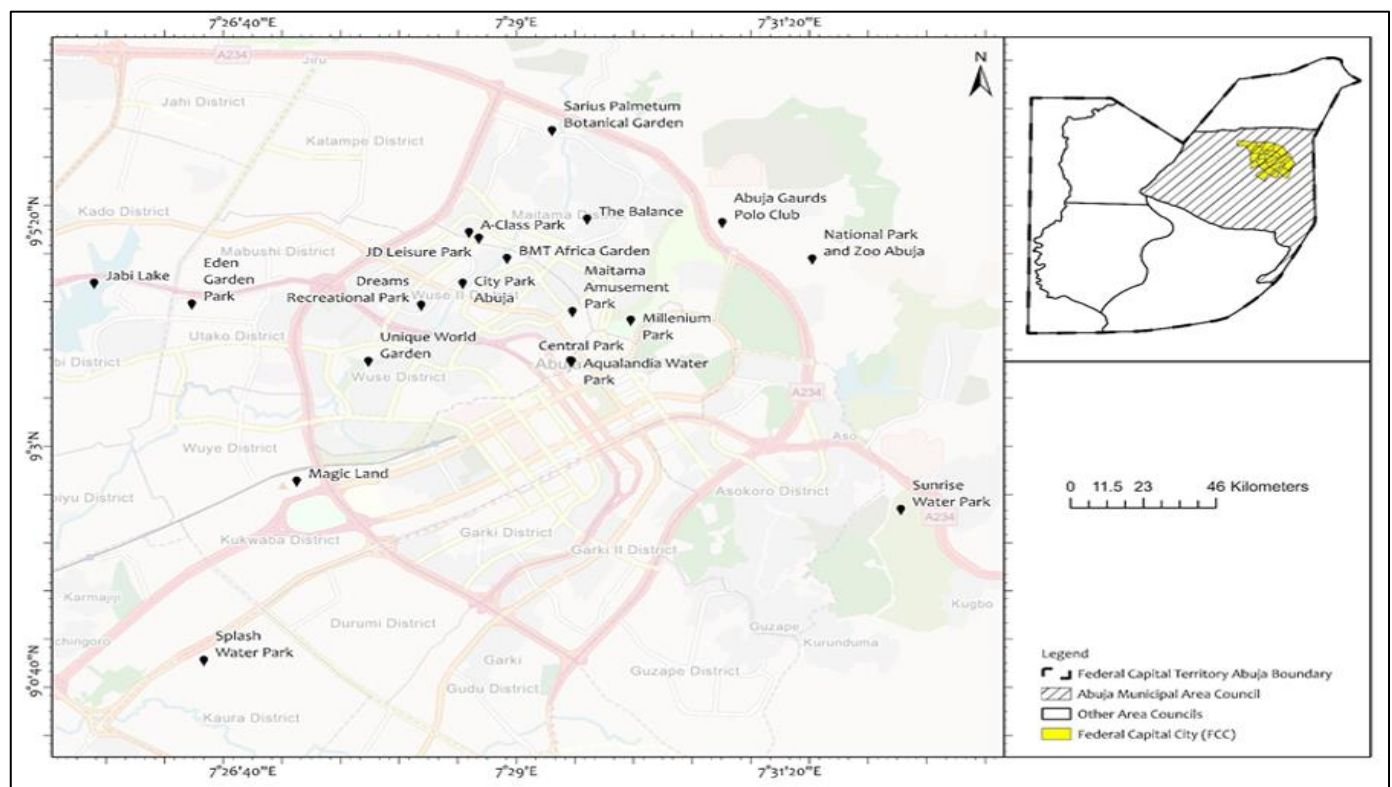


Fig 2 Map Showing Location-Specific Recreational Parks in the FCC
Source: FCDA, Cartography Department.

➤ Sampling Procedure

This study employed a mixed-method approach, integrating qualitative and quantitative research techniques in analyzing recreational activities and environmental sustainability in the Federal Capital City (FCC) of Abuja, Nigeria. The purpose is to explore the link between recreational activities and environmental sustainability in the FCC, Abuja, Nigeria. The study used primary data; collected through questionnaire administration, interviews, field observations and Focus Group Discussion (FGD).

A reconnaissance survey was carried out to identify all the active recreational centres in the FCC. The assessment of recreational centres was done using checklist to ascertain the condition of the recreational centres, identify prominent environmental challenges, and assess the sustainability measures currently in place. The sampling frame for this study comprised all identified and accessible recreational parks within the Federal Capital City of Abuja. The frame was developed from a comprehensive reconnaissance survey, cross-referenced with official listings from the Federal Capital Development Authority (FCDA) and the Abuja Geographic Information System (AGIS). The operational criterion for inclusion in the frame was that the facility must be a designated space primarily used for public leisure and recreation within the city's urban area

Questionnaires were administered to recreational facilities users to generate data types on recreational activities that they engage in and their awareness on sustainable environmental usage. The content of the questionnaire is on issues related to the ecosystem services provided by the various recreational centres, extent of resident's usage of the recreational provisions/facilities in the study area, public perception of sustainable environmental practices in the study area, determine the existing or otherwise sustainable recreational policies in the identified recreational centres in the study area, environmental threats associated with the utilization of these recreational centres in the study area and

data on significance of urban planning in sustainable recreational activities in Abuja City.

Apart from utilizing questionnaire in extracting primary data, semi-structured interviews were carried out with prominent stakeholders, development control officials, environmental experts, and recreational facilities managers. This helped unveil policies and initiatives related sustainability.

Purposive sampling was employed in sampling interviewees. Those to be interviewed are;

- Prominent stakeholders in charge of parks
- Development control officials,
- Environmental experts, and
- Recreational facilities managers.

Interviewing them provides out in-depth information relating to policies and initiatives relating sustainable utilization of parks.

FGD were carried out to enhance the quality of data obtained using questionnaires on the recreational activities and environmental sustainability in the green parks in the Federal Capital City (FCC) of Abuja, Nigeria. In carrying out FGD, sample size of between 10-15 informants were used in carrying out the FGDs which is considered sufficient for a qualitative assessment. Participants in the FGDs includes the;

- Urban planners,
- Area council representative,
- Environmental NGOs,
- Managers or Operators of parks,
- Private enterprise involved in development, operation of recreational spaces
- Users of the parks

Table 1 The Sampling Frame

S/N	NAME	ADDRESS	LOCATION	LONGITUDE	LATITUDE
1.	Central Park	No. 70 Kur Mohammed Avenue.	Central Area District.	9.0637° N	7.4910° E
2.	Splash Water Park	Plot 1164 Cadastral Zone B1.	Beside Games Village, Kaura	9.0119° N	7.4389° E
3.	Blake Resort	Ahmadu Bello Way.	Garki District.	9.1386° N	7.2928° E
4.	Jabi Lake	Alex Ekwueme Way.	Jabi District	9.0771° N	7.4233° E
5.	Magic Land	1 Kukwaba Hills Constitution Avenue.	Wuye, Kukwaba District.	9.0429° N	7.4521° E
6.	The Balance	Shehu Shagari Way.	Maitama District.	9.0882° N	7.4934° E
7.	Maitama Amusement Park	Ibrahim Babangida Boulevard.	Maitama District.	9.0722° N	7.4913° E
8.	Millennium Park	No. 5 Usuma Street.	Three Arms Zone Abuja	9.0707° N	7.4996° E
9.	Sarius Palmetum Botanical Garden	4, Salween Close. IBB Way.	Maitama District.	9.1035° N	7.4884° E
10.	City Park Abuja	Ahmadu Bello Way.	Wuse II District.	9.0771° N	7.4757° E
11.	A-Class Park	Kashim Ibrahim Way.	Wuse II District.	9.0859° N	7.4766° E
12.	JD Leisure Park	Kashim Ibrahim Way.	Wuse II District.	9.0849° N	7.4780° E

13.	Dreams Recreational Park	Aminu Kano Crescent	Wuse II	9.0733° N	7.4698° E
14.	Aqualandia Water Park	174 Kur Mohammed Avenue.	Wuse II	9.0636° N	7.4912° E
15.	BMT Africa Garden	Aminu Kano Crescent	Wuse II	9.0814° N	7.4820° E
16.	Unique World Garden	No. 5 Accra Street	Wuse Zone 5.	9.0636° N	7.4623° E
17.	Eden Garden Park	Augustus Aikhomo Way Utako.	Utako District.	9.0735° N	7.4372° E
18.	Sunrise Water Park	Sunrise Hills Estate, RI.	Sunrise Boulevard Asokoro	9.0380° N	7.5380° E
19.	Abuja Guards Polo Club	Murtal Muhamed Express Road	Asokoro District.	9.0876° N	7.5126° E
20.	National Park and Zoo Abuja	Off Murtal Muhamed Express Road	Asokoro District.	9.0813°N	7.5254°E

Source: Field Researcher's Work, 2025.

The sample size for the survey component of this study was determined using the standard sample size formula for a large, finite population (Cochran, 1977). The calculation aimed to determine the minimum number of respondents required to achieve findings that are statistically representative of the study population with a known level of precision.

The formula applied was:

$$n = \frac{Z^2 * P * (1 - p)}{e^2}$$

Where:

- n = required sample size
- Z = Z-score corresponding to the desired confidence level (1.96 for 95% confidence)
- p = estimated proportion of the population possessing the characteristic (set at 0.5 for maximum variability)
- e = desired margin of error (0.05 or 5%); the sample size was set at 462 respondents.

The data collected from the recreational park users in Abuja were analysed using both descriptive and inferential statistical techniques

III. RESULTS AND DISCUSSIONS

➤ Demographic and Socioeconomic Characteristics of the Respondents and the Class Location-Specific of the Recreational Facilities in the Study Area

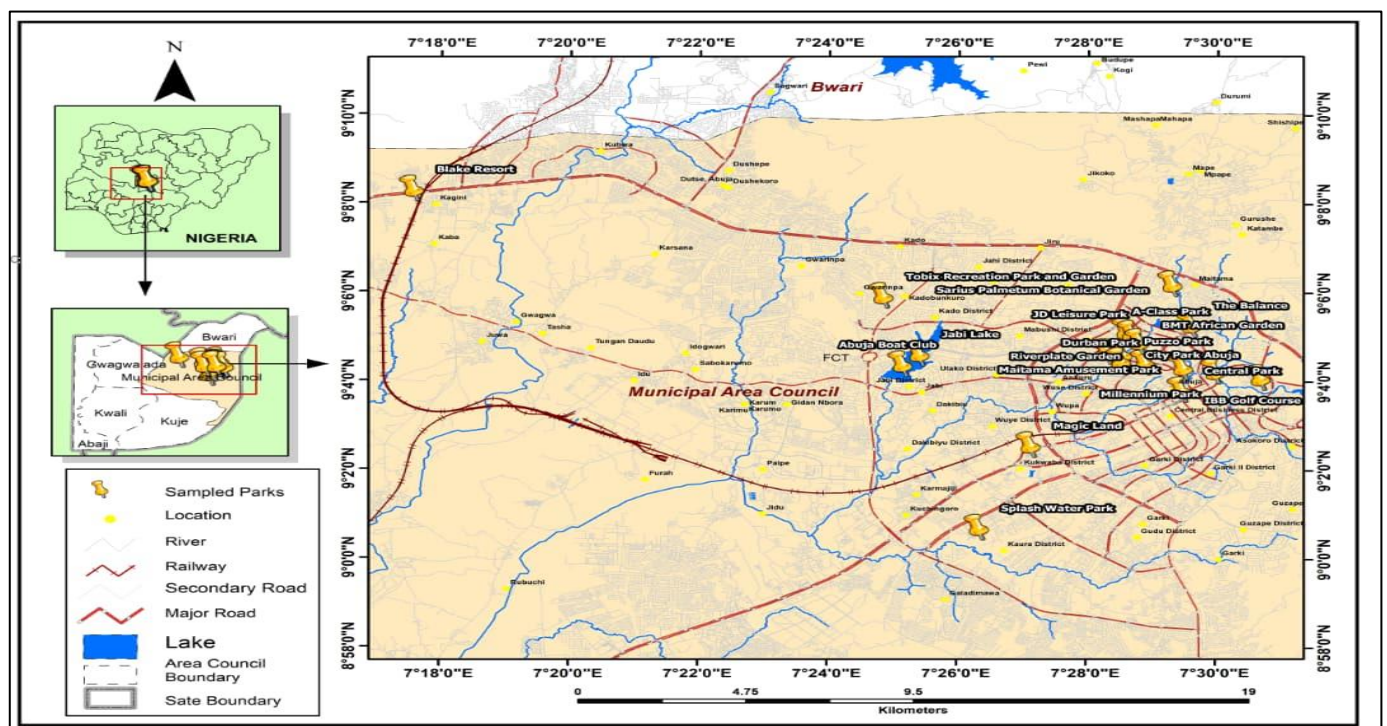


Fig 3 Map Showing Identified Recreational Parks in the Study Area.

Source: FCDA, Cartography Department.

The study sought to profile the respondents across the three types of recreational parks surveyed in the Federal Capital City of Abuja. Key demographic variables analyzed include Sex, Age Group, Income, Marital Status, Education, and Occupation. This is presented in table 2.

The result demonstrates distinct gender patterns across park categories. Large Formal Parks show the most pronounced male majority, with male visitors constituting 59.36% compared to 40.64% female. Neighborhood Parks follow a similar but less pronounced pattern, with 54.32% male and 45.68% female visitors. In contrast, Commercial/Amusement Parks present the most equitable gender balance in the study, with males at 51.52% and females at 48.48%, suggesting these venues are perceived as equally accessible and appealing to both genders. The overall sample composition, with a male-to-female ratio of approximately 56:44, provides a substantial representation from both genders. This balanced representation is crucial for the study, as it allows for a comprehensive, gender-inclusive analysis of recreational preferences and perceptions of environmental sustainability across different park settings. This finding aligns with earlier studies in Abuja which reported higher participation of males in recreational activities, though with substantial female representation as well (Mustapha, Muhammad, & Muhammad, 2021). Given that recreational activities in Abuja, such as picnicking, sporting events and tourism at natural sites, attract both men and women, this balance enhances the representativeness and reliability of the findings.

The age distribution reveals highly specific recreational niches. Commercial/Amusement Parks are overwhelmingly youth-centric, with more than half (53.03%) of all visitors

aged between 20-29 years. The 20-24 cohort alone represents 30.30% of users, the highest concentration of any single age group in the study. Large Formal Parks cater to a much broader demographic but show particular strength among older visitors; those over 40 years represent the largest single cohort at 21.39%, and when combined with the 35-39 group (14.97%), middle-aged and older adults constitute over a third of users. Neighborhood Parks show a definitive peak among middle-aged adults, with the highest proportion of users in the 35-39 bracket (22.22%), and strong representation from the 30-34 and 20-24 groups (both at 20.99%), indicating they serve a mix of young families and established adults. Similar studies have noted that young adults in Abuja constitute the core participants in recreational activities, often engaging in sports, hiking and leisure outings (Majebi & Agbebaku, 2024).

Marital status further clarifies the social function of each park type. Large Formal Parks are predominantly frequented by Single individuals, who constitute an absolute majority at 50.27% of visitors. Commercial/Amusement Parks also show a strong plurality of Single visitors (43.94%). Conversely, Neighborhood Parks are the only category where Married respondents form the largest group (44.44%), solidifying their identity as family-oriented community spaces. A notable secondary finding is that Neighborhood Parks also report the highest proportion of Divorced individuals (11.11%), suggesting they serve as important social nodes for non-traditional households. Previous studies have shown that single individuals tend to be more mobile and inclined toward outdoor recreational activities, while married respondents are more likely to participate in family-oriented recreation (Majebi, Agbebaku, & Orimaye, 2024).

Table 2 Demographic and Socioeconomic Characteristics by Park Group

Demographic Characteristics by Park Type						
Column-wise Percentages (Within Park Type)						
Category	Commercial/Amusement Park (Frequency)	Large Formal Park (Frequency)	Neighborhood Park (Frequency)	Commercial/Amusement Park (Percentage)	Large Formal Park (Percentage)	Neighborhood Park (Percentage)
Sex						
Male	68	111	44	51.52	59.36	54.32
Female	64	76	37	48.48	40.64	45.68
TOTAL	132	187	81	100.00	100.00	100.00
Age Group						
15–19	7	16	3	5.30	8.56	3.70
20–24	40	27	17	30.30	14.44	20.99
25–29	30	38	14	22.73	20.32	17.28
30–34	27	38	17	20.45	20.32	20.99
35–39	14	28	18	10.61	14.97	22.22
>40	14	40	12	10.61	21.39	14.81
TOTAL	132	187	81	100.00	100.00	100.00
Income						
< ₦10,000	24	33	18	18.18	17.65	22.22
₦10,000–20,000	25	35	13	18.94	18.72	16.05
₦20,001–50,000	38	43	19	28.79	22.99	23.46

₦50,001–100,000	19	35	18	14.39	18.72	22.22
₦100,001–500,000	20	32	12	15.15	17.11	14.81
> ₦500,000	6	9	1	4.55	4.81	1.23
TOTAL	132	187	81	100.00	100.00	100.00
Marital Status						
Single	58	94	27	43.94	50.27	33.33
Married	43	66	36	32.58	35.29	44.44
Divorced	9	8	9	6.82	4.28	11.11
Widowed	8	13	4	6.06	6.95	4.94
Separated	14	6	5	10.61	3.21	6.17
TOTAL	132	187	81	100.00	100.00	100.00
Education						
Primary	15	21	7	11.36	11.23	8.64
Secondary	30	49	24	22.73	26.20	29.63
Tertiary	60	83	35	45.45	44.39	43.21
Qur'anic	15	20	9	11.36	10.70	11.11
Others	12	14	6	9.09	7.49	7.41
TOTAL	132	187	81	100.00	100.00	100.00
Occupation						
Farming	15	23	12	11.36	12.30	14.81
Civil Service	39	54	20	29.55	28.88	24.69
Trading	25	43	23	18.94	22.99	28.40
Artisan	33	33	17	25.00	17.65	20.99
Unemployed	20	34	9	15.15	18.18	11.11
TOTAL	132	187	81	100.00	100.00	100.00

Source: Field Survey (2025)

Educational profiles show remarkable consistency across all park types, with a strong foundation of educated users. Tertiary education is the most common attainment level in each category: Commercial/Amusement Parks (45.45%), Large Formal Parks (44.39%), and Neighborhood Parks (43.21%). Secondary education is also well-represented, particularly in Neighborhood Parks (29.63%). This consistent pattern indicates that park users across Abuja are generally literate and educated, which has critical implications for environmental communication strategies. Research in Abuja has similarly highlighted those higher levels of education are associated with stronger awareness of environmental issues and greater willingness to support sustainable practices (Majebi & Agbebaku, 2024).

Occupational data reveals the economic underpinnings of park visitation. Civil Servants are a major constituency across all parks, most prominent in Commercial/Amusement Parks (29.55%). Traders show their strongest representation in Neighborhood Parks (28.40%), aligning with the local, community-based nature of these spaces. Artisans are most prevalent in Commercial/Amusement Parks (25.00%). The Unemployed constitute a significant minority in all settings, largest in Large Formal Parks (18.18%), underscoring the role of public parks as vital, non-commercial spaces for all citizens regardless of employment status. These dynamics reflect earlier findings that affordability and access

challenges significantly influence the use of recreational facilities in Abuja (Majebi, Agbebaku, & Orimaye, 2024).

Income stratification clearly differentiates park utilization. Neighborhood Parks have the highest share of low-income users (< ₦10,000: 22.22%) and a significant middle-class presence (₦50,001–100,000: 22.22%), while having the lowest proportion of high-income visitors (>₦500,000: 1.23%), highlighting their role as essential, accessible community infrastructure. Commercial/Amusement Parks are distinctly middle-income oriented, with their largest user segment in the ₦20,001–50,000 bracket (28.79%), suggesting these venues target economically active young professionals. Large Formal Parks display the most economically diverse visitor base, with relatively even representation across low (<₦10,000: 17.65%), middle (₦20,001–50,000: 22.99%), and upper-middle (₦50,001–100,000: 18.72%) income brackets, reflecting their status as a city-wide public resource. Previous assessments of Abuja's recreational facilities confirm that cost barriers, coupled with inflation and inadequate management, restrict equitable access and intensify environmental pressures (Ezeamaka & Oluwole, 2017; Majebi et al., 2024).

The detailed demographic segmentation has profound implications for the analysis of recreational activities and environmental sustainability in Abuja. The youth-dominated,

single, and middle-income profile of Commercial/Amusement Parks implies that recreational demand here centers on socializing and entertainment, requiring sustainability initiatives that are innovative, digitally integrated, and aligned with youth culture such as gamified recycling programs or social media-driven eco-challenges. The family-oriented, middle-aged, and economically diverse profile of Neighborhood Parks underscores their role as daily life spaces; sustainability here must be practical, community-driven, and focus on safety, cleanliness, and amenities that support family leisure, like shaded playgrounds and well-maintained lawns. The diverse, older, and cross-sectional profile of Large Formal Parks positions them as the city's premier green spaces for passive recreation, environmental education, and city-wide events; their management requires a balanced approach catering to walkers, birdwatchers, families, and large gatherings while protecting ecological integrity.

The high educational attainment across all park types is a pivotal finding, suggesting a strong baseline capacity for understanding environmental issues. This allows for the deployment of more sophisticated sustainability messaging and the potential development of a "citizen steward" network across the city. Conversely, the significant presence of lower-income and unemployed visitors, especially in Neighborhood and Large Formal Parks, imposes a critical equity imperative. Any sustainability measures involving user fees or paid services risk excluding these vulnerable groups. Therefore, the study must analyze how to advance environmental goals while reinforcing, not compromising, the parks' function as essential, free public infrastructure. Ultimately, these distinct demographic portraits demand a differentiated policy and management framework where environmental sustainability strategies are tailored to the specific social fabric and recreational patterns of each park type.

To ensure sustainability, policymakers must therefore prioritize targeted awareness campaigns, effective waste management systems, strict enforcement of park regulations and equitable provision of recreational facilities across the Federal Capital City (Ihuma et al., 2016; Majebi & Agbebaku, 2024).

➤ *Ecosystem Services Provided by Various Recreational Centres and Extent of Residents' Usage of Recreational Provisions/Facilities in the Study Area.*

The results from the table 3, reveal distinct patterns of park usage, perceptions of ecosystem services, and environmental contributions across the three park types in Abuja, with significant variations in visitation frequency, primary benefits, and perceived quality.

The survey results (Table 3) revealed diverse visitation patterns. Neighborhood Parks show the highest level of regular integration, with weekly visits being most common (34.57%), the highest proportion for this category across all parks. Large Formal Parks and Commercial/Amusement Parks show different rhythmic patterns. Large Formal Parks see their highest visitation monthly (30.48%) and during festive periods (28.34%), suggesting planned outings. Commercial/Amusement Parks are distinctly event and festivity-oriented, with the single largest visitation reason being festive periods (32.58%). Notably, "Never" visiting is highest for Neighborhood Parks (14.81%), which may indicate accessibility issues or a lack of relevance for a segment of the immediate community. Similar findings have been reported in Abuja, where studies identified weekends and festive periods as peak visitation times (Majebi & Agbebaku, 2024).

Table 3 Ecosystem Services Provided Recreational Centres

Recreational Park Usage, Ecosystem Services and Environmental Contributions by Park Type						
Column-wise Frequencies and Percentages (Within Park Type)						
Item	Commercial/Amusement Park (Frequency)	Large Formal Park (Frequency)	Neighborhood Park (Frequency)	Commercial/Amusement Park (Percentage)	Large Formal Park (Percentage)	Neighborhood Park (Percentage)
Frequency of Visit						
Weekly	30	35	28	22.73	18.72	34.57
Monthly	37	57	20	28.03	30.48	24.69
Yearly	14	20	7	10.61	10.70	8.64
Festive	43	53	14	32.58	28.34	17.28
Never	8	22	12	6.06	11.76	14.81
TOTAL	132	187	81	100.00	100.00	100.00
Reasons for Visiting Recreational Parks						
Cultural Activities	49	78	36	37.12	41.71	44.44
Exercise and Fitness	62	96	40	46.97	51.34	49.38
Family Outing	32	46	17	24.24	24.60	20.99
Nature Appreciation	71	97	52	53.79	51.87	64.20
Relaxation and Leisure	66	74	24	50.00	39.57	29.63
Social Interaction	37	57	21	28.03	30.48	25.93
Quality of Recreational Facilities						

Excellent	17	32	20	12.88	17.11	24.69
Good	53	66	21	40.15	35.29	25.93
Fair	39	46	23	29.55	24.60	28.40
Poor	14	25	10	10.61	13.37	12.35
Very Poor	9	18	7	6.82	9.63	8.64
TOTAL	132	187	81	100.00	100.00	100.00
Accessibility of Facilities						
Yes	76	93	41	57.58	49.73	50.62
No	29	53	21	21.97	28.34	25.93
Not Sure	27	41	19	20.45	21.93	23.46
TOTAL	132	187	81	100.00	100.00	100.00
Ecosystem Services Provided by Recreational Parks						
Aesthetic Value	53	72	35	40.15	38.50	43.21
Clean Air Provision	65	80	39	49.24	42.78	48.15
Cultural Benefits	58	78	36	43.94	41.71	44.44
Educational Opportunities	48	77	25	36.36	41.18	30.86
Mental Health Support	49	81	37	37.12	43.32	45.68
Temperature Regulation	50	74	28	37.88	39.57	34.57
Water Regulation	41	79	36	31.06	42.25	44.44
Wildlife Habitat	84	119	45	63.64	63.64	55.56
Impact of Recreational Parks on Wellbeing						
Yes	104	141	66	78.79	75.40	81.48
No	28	46	15	21.21	24.60	18.52
TOTAL	132	187	81	100.00	100.00	100.00
Contribution to a Good Environment						
Yes	99	151	57	75.00	80.75	70.37
No	33	36	24	25.00	19.25	29.63
TOTAL	132	187	81	100.00	100.00	100.00
Ways Recreational Parks Contribute to a Good Environment						
Improved Aesthetic View	36	65	29	27.27	34.76	35.80
Improved Air Quality	21	31	22	15.91	16.58	27.16
Improved Physical & Social Life	75	91	30	56.82	48.66	37.04
TOTAL	132	187	81	100.00	100.00	100.00

Source: Field Survey (2025)

The FGD data reinforce this pattern. Park managers and council representatives consistently noted high visitation during weekends, holidays and festive seasons, particularly in popular parks such as Jabi Lake and Millennium Park. However, FGDs also emphasized spatial inequity: while central districts enjoy better park infrastructure.

Ihuma *et al.* (2016) similarly observed inadequate park provision and uneven spatial distribution across the Federal Capital Territory. Triangulation therefore suggests that visitation is high but unevenly distributed, highlighting an equity gap in recreational accessibility.

The motivations for park use show both shared values and distinct priorities. Nature Appreciation is a primary driver across all parks, peaking in Neighborhood Parks (64.20%). Exercise and Fitness is also a major universal reason, highest in Large Formal Parks (51.34%). Relaxation and Leisure shows the starkest variation: it is the second strongest reason for Commercial/Amusement Parks (50.00%) but ranks much

lower for Neighborhood Parks (29.63%). Cultural Activities find strong relevance across all, slightly highest in Neighborhood Parks (44.44%). This indicates that while all parks serve multi-functional roles, Neighborhood Parks are strongly valued for nature and culture, Commercial parks for leisure and relaxation, and Large Formal Parks for structured exercise.

The FGD study also confirmed that users emphasized relaxation, family gatherings and social interaction. However, NGOs and planners highlighted the broader ecological and educational roles of parks, including biodiversity conservation, environmental education and climate regulation (Majebi, Agbebaku, & Orimaye, 2024). This divergence points to a gap between public perceptions focused on immediate benefits and stakeholder advocacy emphasizing long-term sustainability functions.

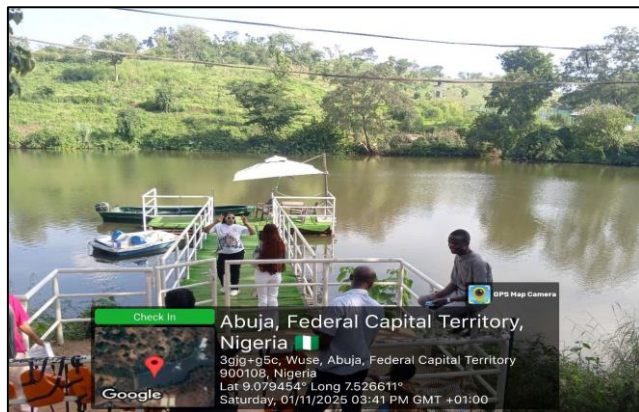


Plate 1 National Park and Zoo Abuja



Plate 5 Toilets and Waste Collection Packs in Central Park Abuja

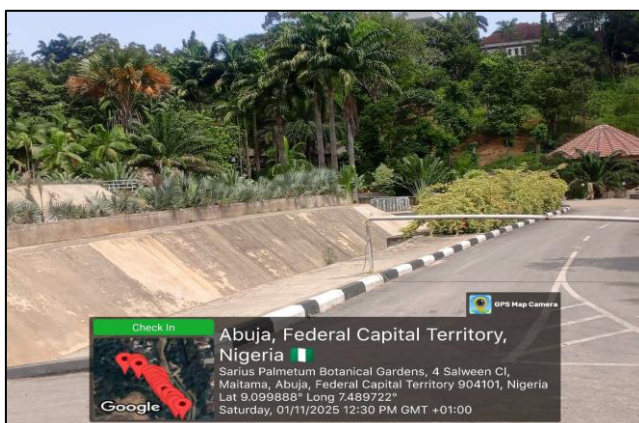


Plate 2 Sarius Palmetum Botanical Garden



Plate 3 Game Arena at Abuja Guards Polo Club



Plate 6 Millennium Park



Plate 4 Visitors/Users of Millenium Park

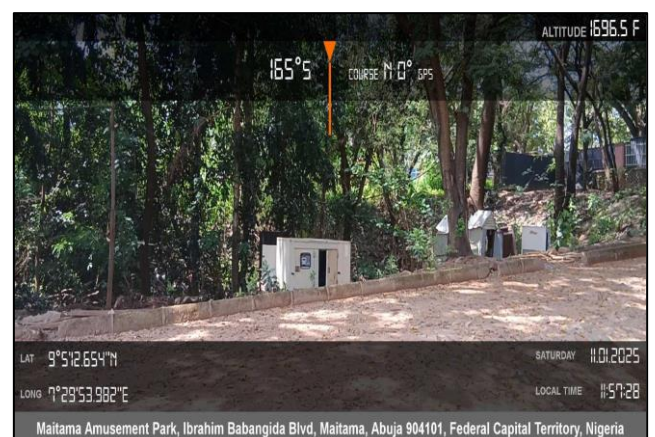


Plate 7 Maitama Amusement Park

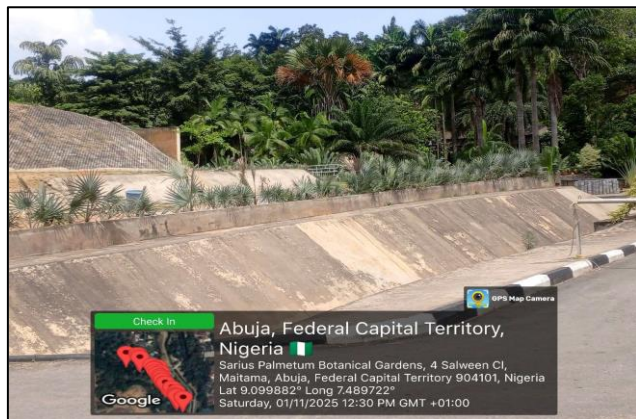


Plate 8 Sarius Palmetum Botanical Garden

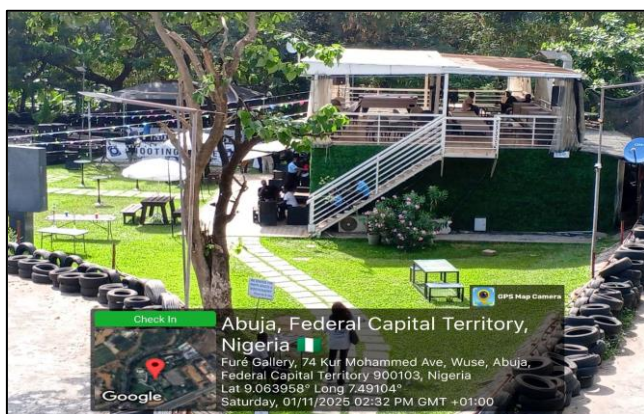


Plate 9 Central Park

Perceptions of quality and access are critical for sustainability. The perceived Quality of Recreational Facilities rated as "Good" or "Excellent" is highest in Commercial/Amusement Parks (53.03%), followed by Large Formal Parks (52.40%), and lowest in Neighborhood Parks (50.62%). Conversely, Accessibility of Facilities (a clear "Yes") is perceived best in Commercial/Amusement Parks (57.58%), with Large Formal (49.73%) and Neighborhood Parks (50.62%) facing more significant access challenges. This suggests a potential gap where Neighborhood Parks, despite being closest to users, are not seen as having the best quality or most accessible facilities.

These results contrast with FGDs, where stakeholders raised concerns about inadequate lighting, insufficient toilets, insecurity and overcrowding (See Plate 5). The FGD interview highlighted underfunding and neglect of facilities outside central districts.

Similar concerns about poor maintenance, inadequate greening and security challenges in Abuja's parks have been reported by Ihuma et al. (2016) and Ezeamaka and Oluwole (2017). Triangulation thus reveals a contrast between public satisfaction based on limited alternatives and stakeholder recognition of deeper structural weaknesses.

Survey respondents also associated recreational centres with multiple ecosystem services. Recognition of ecosystem services is strong but varies by service type. Wildlife Habitat is the most recognized service across Commercial and Large

Formal Parks (both 63.64%), though it is lower in Neighborhood Parks (55.56%). Clean Air Provision and Mental Health Support are highly valued across the board. Cultural Benefits are consistently acknowledged (~44% across all). Educational Opportunities are most recognized in Large Formal Parks (41.18%), while Water Regulation is notably less recognized in Commercial/Amusement Parks (31.06%) compared to others. This shows that regulating services (air, water, temperature) are less universally acknowledged than cultural and supporting services.

The FGD interview supported this finding as users equated sustainability primarily with cleanliness and greenery, while Key Informant interview with some of the respondents emphasized ecosystem services such as biodiversity conservation and flood control which supported the findings of (Majebi & Agbebaku, 2024). This convergence on visible benefits as well as on less tangible ones highlights the need for environmental education to broaden public understanding of the ecological functions of recreational centres.

The survey also revealed a strong association between recreational centres and well-being. The Impact on Wellbeing is affirmed most strongly by users of Neighborhood Parks (81.48%), followed by Commercial/Amusement (78.79%), and Large Formal Parks (75.40%). Similarly, the belief that parks Contribute to a Good Environment is highest among Large Formal Park users (80.75%). Regarding the specific Ways Parks Contribute, "Improved Physical & Social Life" dominates for Commercial/Amusement users (56.82%). In contrast, Neighborhood and Large Formal Park users place more emphasis on "Improved Aesthetic View" (35.80% and 34.76% respectively) and "Improved Air Quality" (27.16% for Neighborhood Parks).

And this is in line with FGD findings, that respondents emphasized relaxation, exercise and social bonding, while Key informant interview stressed broader ecological contributions such as climate regulation and biodiversity protection. These results align with Mustapha et al. (2021), who found that participation in recreational activities in Abuja contributes significantly to mental and physical health.

These findings have profound implications for aligning recreational management with environmental sustainability goals in Abuja. The high weekly use of Neighborhood Parks underscores their role as essential everyday infrastructure; therefore, their environmental sustainability is directly linked to community public health. However, their lower quality and access ratings signal a pressing need for targeted investment to enhance their ecological and recreational function, turning them into catalysts for local environmental stewardship.

The festive and leisure-driven use of Commercial/Amusement Parks, coupled with their high facility ratings, indicates they are destinations for occasional, high-impact use. This creates a critical management focus on managing visitor density, waste generation during peaks, and ensuring that commercial activities do not degrade the very natural assets (like wildlife habitat, which is highly

recognized here) that attract visitors. Sustainability here must integrate business models with carrying capacity.

Large Formal Parks, with their monthly visitation for exercise and nature appreciation, and high recognition of educational and regulating services, are positioned as the city's primary platforms for formal environmental education and climate change adaptation (e.g., through temperature regulation). Their management should explicitly promote these roles through curated educational programs and infrastructure that showcases ecosystem functions.

The universal high recognition of Mental Health Support and Wellbeing Impact across all parks provides a powerful, common narrative. This consensus is a strategic asset for advocating for park conservation and expansion, framing it as a public health imperative. However, the lower recognition of regulating services like water regulation, especially in commercial settings, reveals a key gap in public environmental literacy. This points to a vital need for interpretive signage and community programs that make these invisible ecosystem services visible and valued, fostering a deeper public commitment to protecting the ecological integrity of all parks and not just their recreational facilities.

IV. CONCLUSION AND RECOMMENDATION

The study provides a comprehensive assessment of the spatial use patterns, user characteristics, perceived ecosystem services, and environmental implications of recreational parks in the Federal Capital City (FCC), Abuja. The findings reveal that recreational parks in Abuja are functionally differentiated, serving distinct demographic, socio-economic, and recreational needs across Large Formal Parks, Neighborhood Parks, and Commercial/Amusement Parks. Large Formal Parks function as inclusive, city-wide recreational and ecological spaces, attracting a diverse user base with strong representation of middle-aged and older adults, and serving key roles in physical exercise, nature appreciation, and environmental education. Neighborhood Parks operate primarily as community-oriented, family-centered spaces with high weekly visitation and strong reliance on nature appreciation, cultural interaction, and everyday leisure activities. However, they also reflect notable infrastructural and accessibility limitations. Commercial/Amusement Parks, in contrast, are largely youth-driven, event-based recreational spaces characterized by leisure, entertainment, and festive use, with higher perceived facility quality but also greater environmental pressure during peak periods.

Across all park types, users are generally well-educated and demonstrate strong awareness of the wellbeing and cultural benefits of recreational spaces, though understanding of regulating ecosystem services such as water regulation and climate functions remains limited. This indicates a gap between perceived recreational value and deeper ecological understanding. The study further concludes that recreational parks in Abuja significantly contribute to physical health,

mental wellbeing, social interaction, and environmental quality perception. However, these benefits are unevenly distributed due to disparities in infrastructure quality, spatial accessibility, and management effectiveness. The observed inequalities highlight broader urban planning challenges, particularly in ensuring equitable access to functional green infrastructure across the city.

Recreational parks in Abuja represent critical socio-ecological assets, but their sustainability is currently constrained by management inefficiencies, spatial imbalance, and limited environmental literacy among users. Addressing these challenges requires differentiated but integrated planning approaches that reflect the unique functions and user profiles of each park type.

➤ Recommendations

- Urban planners and park authorities should implement tailored management frameworks that reflect the distinct functions of each park type: community-focused maintenance for Neighborhood Parks, conservation and education-oriented management for Large Formal Parks, and visitor-carrying-capacity control for Commercial/Amusement Parks.
- Priority should be given to upgrading facilities such as lighting, sanitation, security, seating, and landscaping in Neighborhood Parks to improve accessibility, safety, and user satisfaction, given their role as daily-use community infrastructure.
- All parks should adopt strict waste management protocols, especially during peak festive periods in Commercial/Amusement Parks. Provision of adequate bins, recycling systems, and enforcement of anti-littering regulations is essential.
- Environmental interpretation tools such as signage, guided tours, school programs, and digital campaigns should be introduced to improve public understanding of less visible ecosystem services such as water regulation, biodiversity conservation, and climate regulation.
- Policies should ensure that low-income and vulnerable groups are not excluded through indirect costs or spatial neglect. Investment in underserved districts is necessary to reduce spatial inequality in recreational access.
- Given the strong evidence of wellbeing benefits, recreational parks should be formally integrated into urban public health policies and climate resilience planning, particularly as tools for heat reduction, mental health support, and social cohesion.
- Commercial/Amusement Parks should adopt visitor management strategies such as scheduling systems, entry limits during peak periods, and infrastructure expansion to reduce environmental degradation during festivals and holidays.
- Improved collaboration between urban planning agencies, environmental bodies, and local governments is required to ensure consistent funding, maintenance, and monitoring of recreational facilities across Abuja.
- Given the high educational profile of users, a volunteer-based "park stewardship" initiative should be introduced

to encourage community participation in monitoring cleanliness, reporting damages, and promoting sustainable use of recreational spaces.

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