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Research Article

An Evaluation of the Status of Pocket Parks and Their Impact in the Jos Metropolis

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Abstract: A pocket park is an area of open space provided for recreational use which is of immense benefits to a community and its citizens, including economic, health, environmental, social, and overall quality of life. The main thrust of this paper is to evaluate the status of pocket parks and their impact in Jos, metropolis consisting of three Local Government Areas in the North-Central geopolitical zone of Nigeria.Field surveys by questionnaire and interviews were the main tools of data collection while Secondary data were collected from relevant literatures. Purposive random sampling technique was used to select 135 individuals. A total of 71 respondents were selected from Jos North, 50 respondents from Jos South and 14 respondents from Jos East.
A total of One Hundred and Thirty-Five (135) questionnaires were distributed to respondents of which a total of 105 (77.78%) were retrieved and used for analysis. Data collected were analyzed using descriptive and inferential statistic. The research revealed that majority of the respondents were within the age of 20-24, predominantly male, most of who were single, and majority possess tertiary education. The study reveals that most pocket parks are established without security, poor designed layout plans, inadequate landscape elements and lack sufficient recreation infrastructure that promote well-being of the human body. The findings of this research can be used as guide in related areas to improve and enhance the quality of public spaces in urban parks to fulfil the needs and requirements of urban dwellers and visitors.
Keywords*:* Health, Metropolis, Open space, Pocket parks, Status.

Introduction

A park is an area of open space provided for recreational use. It can be in its natural or semi-natural state, or planted, and is set aside for human enjoyment or for the protection of wildlife or natural habitats. It may consist of rocks, soil, water, flora and fauna and grass areas, but may also contain buildings and other artefacts such as play grounds (Sal ford City Council, 2008). Many natural parks are legally protected by law and provide avenue for recreation which is of immense benefits to a community and its citizens, including economic, health, environmental, social, and overall quality of life (Sal ford City Council, 2008).

Contextual to this paper, Pocket or Mini parks are small pieces of parkland meant to serve a residential or business area within a one quarter mile radius (National Recreation and Park Association, 2012). These parks are miscellaneous urban-type open spaces and include historical sites, or other small developed green spaces in neighbourhoods and their shapes may vary considerably. Pocket parks may include special historical or recreational features, and landscape features (National Recreation and Park Association, 2012).

The benefits of pocket parks go far beyond their communities, as they positively impact the well-being of the city and the region in which they are located. The fact that the park size is no more than ¼ of an acre doesn't impede it to offer a place for people to gather, relax, or to enjoy the outdoors (National Recreation and Park Association, 2012). Where vacant lots have been converted into small parks and community green spaces are associated with reduced crime, more exercise, improved perceived safety, lower rates of health complaints and better mental health when compared to neighborhoods with unimproved vacant lots.

According to the National Recreation and Park Association (2012), other multiple benefits of pocket parks are to:

- ✓ Support the overall ecology of the surrounding environment
- ✓ Help protect and conserve local wildlife, landscape, and heritage
- ✓ Reduce pollution, traffic, and consumption of resources, such as oil
- ✓ Empower local residents to make decisions that affect their community
- ✓ Make communities safer and more sociable
- ✓ Regenerate run-down areas
- ✓ Reinforce relationships between local authorities and communities

In addition to plants, a park may have a number of non-plant materials in the landscape, including fountains, benches, playground equipment and statues (Acquaah, 2009). Modern cities are characterized by dense population, heavy industrial carbon release, reduced greeneries and this is associated with greater energy requirement. These had been linked to the occurrence of lifestyle and stress related disorders such as type 2 diabetes, obesity, cardiovascular disease and depression and mental fatigue (Mitchell, *et al.*, 2008).

In Jos metropolis pocket parks are not given much attention despite the enormous imparts to the environment (to human, wild-life, and to the green revolution). Again going through existing literature, there is an apparent gap that this paper helps attempts to abridge by exploring the potential contributions of pocket parks as a resource for general health benefits and increasing the quality of the urban green infrastructure.

The main thrust of this paper, therefore, is to evaluate the status of pocket parks and their impact within Jos metropolis. The specific research objectives are to:

(1) assess nature of pocket parks in enhancing human well-being in urban areas

(2) evaluate the current state of landscape development of pocket parks,

(3) determine the level of satisfaction from patronage of pocket parks.

In realizing this goal, the following research questions were raised:

- ✓ How does the nature of pocket parks promote human health?
- ✓ To what extent has the pocket park been landscaped?
- ✓ What are the multiple benefits of patronising pocket parks?

These brought about the following hypothesis:

- ✓ The null hypothesis [$\mathbf{H_0}$] state that pocket parks have no significant effect in promoting human health.
- ✓ The alternative hypothesis [$\mathbf{H_1}$] states that pocket parks have significant effect in promoting human health.

The study broadly considers Jos metropolis which consist basically three (3) local government areas (Jos East, Jos South and Jos North). Since most of the pocket parks to be considered are located in the Jos north Local Government Area.

Ten pocket parks were evaluated as case studies within the Jos metropolis which include:

- ✓ Jubilee pocket park along Bingham University Teaching Hospital.
- ✓ Garden of Peace and Forgiveness/Zaria Tares Phase I along OLA Hospital/Zaria Tares phase II.
- ✓ Polo field pocket park.
- ✓ Naraguta hostel pocket park.
- ✓ St. Paul`s primary school pocket park.
- ✓ House of assembly`s pocket park.
- ✓ Village hostel pocket park University of Jos.
- ✓ Old JUTH pocket park.
- ✓ Chinese garden pocket park
- ✓ Ray-field resort pocket park.

Materials and Methods

Study Area

Jos–North local government is located at the extreme north of Plateau State on Latitudes 09^0 53^1 and 09^0 59^1 North, and Longitudes 08^0 51^1 and 09^0 02^1 East. It shares boundary to the North with Toro Local Government Area of Bauchi State; to the South with Jos-South Local Government area; to the North-East with Jos-East Local Government Area; and to the West with Bassa Local Government Area (Aliyu, *et al.*, 2019).

Jos-North Local Government enjoys a temperate climate with average temperatures of between 28^0C (81.7^0F) maximum and 11^0C (51.7^0F) minimum. It covers the total land area of 291 km^2 (112 sq mi) with the 2006 provisional population census figure of 429,300 people.

The warmest temperatures usually occur in the dry season months of March and April (Aliyu, *et al.*, 2019). Similarly, Jos-North Local Government is characterized by a mean annual rainfall of between 1317.5mm (131.75cm) and 1460.00mm (146.0cm), mostly in May to August. The Onset and Cessation of rainfall in Jos-North are experienced in April (±15 days in April), and October (±15 days in October). Relative humidity is characterized by a marked seasonal variation (Aliyu, *et al.*, 2019).

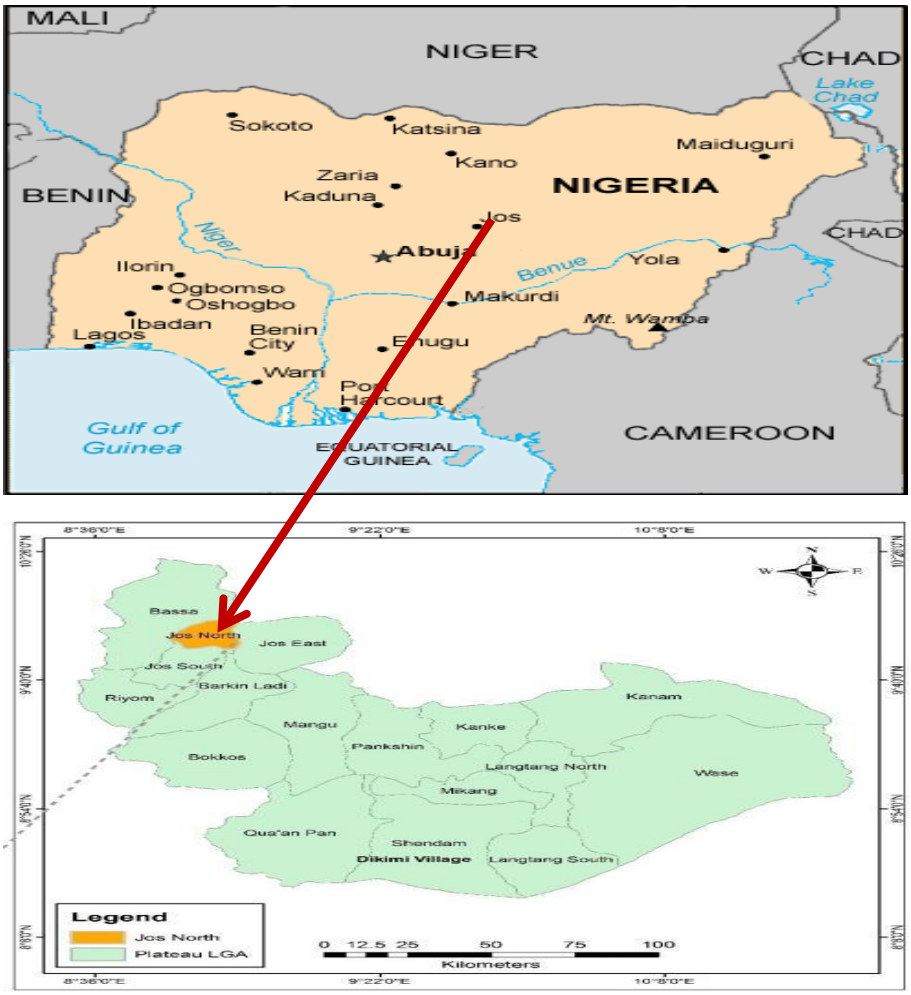

Figure 1. Map of Nigeria (top) showing Jos and Map of Plateau State (down) showing Study area.

Source: Adapted from Orewere, *et al.*, 2019.

Figure 1 above shows the map of Nigeria (top) and map of Plateau State (bottom) showing the study area.

Sampling Procedure

The studies covers the three (3) local government Areas but with more emphasis on Jos North Local Government Area which consists only one district (Gwong) with fourteen (14) wards include; Gangare, Tudunwada/Kabong, Jentaadamu, Apata, Vanderpuye, Josjarawa, Ibrahimkatsina, Tafawabalewa, Alikazaure, Naragutaa, Naragutab, Sarkinarab, Abbanashehu, and Grabadah ward because most of the pocket parks are situated in such location. Due to the scattered distribution of the pocket parks within the Metropolis only Ten (10) were randomly selected to be considered for this study.

Data Collection

The study employed the use of two data sources which were primary and secondary data. The primary data used were visual survey, questionnaires and the use of digital camera to capture images of interest to the study, while the secondary data used include, published materials such as books, academic and professional journals, published information, article, dissertations and geographical maps of Nigeria, Plateau State.

Sampling Design and Questionnaire Administration

In other to select respondents for questionnaire administration survey, a purposive sampling technique was administered across the metropolis .In stage one, the three local government in Jos Metropolis which constitute Jos North, Jos South and Jos East Local Government Areas of Plateau State were identified and 71 respondents were selected from Jos North been the largest followed by Jos South with 50 respondents and Jos East with 14 respondents been the least populated all in the same senatorial district which is Plateau North.

In stage two, since the sample size obtained for distribution within the Jos Metropolis was 400 one-third of the sample size was used to obtain 132 as 135 (See Table 2) were distributed to minimize error instead of 132 using purposive sampling technique with 105 questionnaires retrieved.

Table 1. Senatorial Districts, LGAs, Selected LGAs, Population and Projected Population

S/N	Senatorial Districts	LGAs	Selected LGAs	Population	Projected Population
1	Plateau North	Jos North	Jos North	437,217	626,676
2		Jos South	Jos South	311, 392	446,327
3		Jos East	Jos East	88,301	126,564
4		Riyom		131,778	
5		BarkinLadi		179,805	
6		Bassa		189,834	
7	Plateau Central	Bokkos		179,550	
8		Kanam		167,619	
9		Kanke		124,268	
10		Pankshin		190,114	
11		Mangu		300,520	
12	Plateau South	Langtang North		142,316	
13		Langtang South		105,173	
14		Shengdam		205,119	
15		Wase		159,861	
16		Qua'an pan		197.276	
17		Mikang		96,388	
Grand Total				3,206,531	1, 199,567
Source: Modified from NPC, 2009					

Sample Size

The population (See Table 1) of the target local government areas were projected statistically using 3% growth rate as given by the National Bureau of Statistics (NBS, 2017) to have a relatively up to date population figure using the exponential formula of population projection as shown below

$P = P_0 \times e^{rt}$

Where:

a. P= Total Population after time "t"
b. P_0= Base year Population

c. r = Percentage growth rate
d. t = Years interval
e. e = Euler number (2.71828)

Secondly, to determine the proportion of questionnaires to be administered in the selected Local Government Area, The Yamane (1967) formula for sample size was used. The formula given as:

$$SS = \frac{N}{1 + N(e)^2}$$

Where:
SS = Sample Size
N = Total population under study
e = Acceptable error size usually 0.05

That is,

$$SS = \frac{1{,}199{,}567}{1 + 1{,}199{,}567(e)^2}$$

SS = 400

Sample Size is ascertained as calculated to be 400

One third of the sample size was used which amounts to 132 of the sample population using purposive sample technique to administer questionnaires to respondents.

In the backdrop of all calculation done, to obtain the proportion of questionnaire to be administered in the respective selected wards, the same Yamene (1967) formula was used as shown below:

$$\frac{n \times SS}{N}$$

n = Total population of each selected Local Governments Wards
N = Total population of the entire population under study (Total Population of the selected wards).

SS= Sample Size.

Table 2. Senatorial Districts, Selected LGAs, Projected Population, Percentage of Population and Apportioned Questionnaire

Senatorial Districts	Selected LGAs	Projected Population	Percentage of Population	Apportioned Questionnaire
Plateau North	Jos North	626,676	52	71
	Jos South	446,327	37	50
	Jos East	126,564	11	14
Grand Total		1,199,567	100	135
Source: Modified from NPC, 2009				

Data Analysis

The data collected was both descriptive and inferential statistic. Descriptive statistic such as the use of percentages, frequency distribution and tables, was used to analyse objective (i) while Likaert scale was used to analyse objective (ii) and (iii), objective (iv) was analysed using multiple linear regression.

Model Description

Multiple linear regressions in relation to the discourse is:

If $Y= \alpha +B_1x_1+B_2x_2 +B_3x_3 +B_4x_4…..B_{nXn…e}$

Therefore;
Y=Level of Enjoyment Derived
X_1Park Access
X_2Aesthetics
X_3Cost Efficiency
X_4Park Security
X_5Park Biodiversity
X_6Park Layout
e=error estimation

Hence, the level of enjoyment of a pocket park is dependent on the following listed variables; its accessibility, aesthetics (beauty), cost efficiency, security, biodiversity, layout among others.

Results and Discussions

This section gives in detail information gotten from data analysis in order to achieve the aim of the research. Findings from this study are as follows:

Background information of the Respondents

Sex Distribution

The results for gender of respondents of various socio-demographic characteristics displayed in Table 3 below shows that majority of the respondents were males constituting 67.6% of the total respondents while the females constituted 32.4% of the respondents. The male dominance is due to religious and cultural ethics in the study area were male function as bread winner and hence are faced with outdoor day to day pre-exposed jobs. Hence, making them most accessible.

Table 3. Distribution of Respondents due to Sex

Gender	Frequency	Per cent (%)
Male	71	67.6
Female	34	32.4
Total	**105**	**100.0**
Source: Field Survey, 2019		

Distribution of Respondents due to Marital Status

The result in Table 4 below shows that 84% of the respondents are single while 13.3% of the respondents are married, as only 1.0% is divorced of the respondents and 1.0% of the respondents have a missing detail concerning the research process.

Table 4. Distribution of Respondents due to Marital Status

Marital Status	Frequency	Per cent (%)
Single	90	85.7
Married	14	13.3
Separated / Divorced	1	1.0
Total	**105**	**100**
Source: Field Survey, 2019.		

Age of Respondents

Results from table 5 below shows that in age distribution, 30.5% of the respondents were within the ages of 20-24 years,28.6% of the respondents were within the ages of 15-19 years, 26.7% of the respondents were within the ages of 25-29 years,8.6% of the respondents were within the ages of 30-34 years, 3.8% of the respondents were within the ages of 35-39 years, 3.6% of the respondents were within the ages of 30-34 years,1.0% of the respondents were spread within the ages of 40-44years and 50 years and above, and non-responded to ages 45-49 years.

Table 5. Distribution of Respondents based on Age

Age	Frequency	Per cent (%)
15-19	30	28.6
20-24	32	30.5
25-29	28	26.7
30-34	9	8.6
35-39	4	3.8
40-44	1	1
45-49	0	0
≥50	1	1
Total	**105**	**100**
Source: Field Survey, 2019.		

Level of Education of Respondents

The result in Table 6 below shows the educational level of the respondents that 63.8% of the respondents had tertiary education, 33.3% of the respondents had secondary education, 2.9% of the respondents had primary/Quranic education. These were expected as the study location is an urban area with high literacy rate. Hence, the highest respondents were those of the tertiary education due to higher level of exposure, compared to other educational levels.

Table 6. Distribution of Respondents based on Level of Education.

Educational Level	Frequency	Per cent (%)
Primary	3	2.9
Secondary	35	33.3
Tertiary	67	63.8
None	0	0.0
Total	**105**	**100.0**
Source: Field Survey, 2019.		

Occupation of Respondents

The result in Table 7 below reveals that 66.7% of the respondents are students,14.3% of the respondents are farmers, as 6.7% approximately of the respondents are small scale business

owners,5.7% of the respondents are civil servants,4.8% of the respondents are casual labourers, and 1.9% of the respondents are large scale business owners.

Table 7. Occupation of Respondents

Primary Occupation	Frequency	Per cent (%)
Civil servant	6	5.7
Casual labourer	5	4.8
Small scale business	7	6.7
Large scale business	2	1.9
Farmer	15	14.3
Student	70	66.7
Others	0	0.0
Total	**105**	**100.0**
Source: Field Survey, 2019.		

Location of Respondents

Results from Table 8 below shows the location distribution in Jos Metropolis which cuts three Local Government of Plateau State, 50.5% of the respondents were from Jos North, 38.1% from Jos South and 11.4% from Jos East. Therefore, the respondents from Jos North had the highest percentage of responsiveness.

Table 8. Distribution of Respondents based on Location

Location	Frequency	Per cent (%)
Jos North	53	50.5
Jos South	40	38.1
Jos East	12	11.4
Total	**105**	**100**
Source: Field Survey, 2019.		

Visit to Pocket Parks in Enhancing Human Well-Being

From the view point of the research objective 1, it is evident that 87.6% visited more than one to less than four pocket park, followed by 10.5% maintained a park visit while 1% visited five parks, same as those who had an equal distribution of 1% but with a visit of six parks. This is due to the various level of enjoyment derived from each park, closeness in proximity, aesthetics, cost for enjoyment of such park to be attained as it goes a long way in promoting human well-being (see Table 9).

Table 9. Distribution of Respondent based on Visit Status to Pocket Park.

Parks Visited	Frequency	Per cent (%)
0	11	10.5
1	92	87.6
5	1	1.0
6	1	1.0
Total	**105**	**100.0**
Source: Field Survey, 2019.		

State of Landscape Development of Pocket Parks

From the view point of the research objective 2, it is evident that 21% of the respondent suggested re-infrastructure and security, as 20% suggested topiary improvement, as 10.5%

suggested governmental intervention while 10.5% suggested improvement using soft and hard landscape materials, 8.6% suggested use of bollards, as 7.6% suggested addition of furnishings ,6.7made no suggestions,4.8% suggested creation of more sculptor works ,3.8% suggested painting of landscape,1.9% suggested lightening of pocket parks for night use and aesthetics, as another 1.9%respondent suggested an advocacy for more patrons to visit pocket packs, as 1% suggested construction of gazebo, while 1% suggested structural maintenance of pocket parks and another 1% suggested fencing (see Table 10)

Table 10. Distribution Respondents based on Landscape Development

Constraints	Frequency	Per cent (%)
Government intervention	11	10.5
Landscape with hard and soft material	11	10.5
Lightening	2	1.9
Furnishing	8	7.6
Gazebo	1	1.0
Sculptor works	5	4.8
More patrons	2	1.9
None	7	6.7
Painting	4	3.8
Re-infrastructure and Security	22	21.0
Topiary	21	20.0
Structural maintenance	1	1.0
Fencing	1	1.0
Bollards	9	8.6
Total	105	100.0
Source: Field Survey, 2019		

Level of satisfaction from patronage of the Pocket Parks

From the view point of the research objective 3, it is evident that Aesthetics, Park Security, and Park Layout are factors determining the level of satisfaction derived from the pocket parks as seen in Table 11. The regression analysis shows how aesthetics influence the level of patronage and this is due to fact beauty attracts, so the more appealing the pocket park is the more patrons use it. Security also influences the use of pocket park use and this is due to level of insurgency, unsafe lives and properties are within Jos metropolis as which has arouse the fear of staying in a populous place and this includes pocket parks. Therefore, the safer patrons feel and are in parks it leads to more patronization. The Pocket park`s layout also influences highly patron satisfaction. This is because the structural patterns, design, make ups and beauty attract patrons greatly.

Table 11. Distribution of Respondents Based on the level of satisfaction

Variables	Coefficient	Std. Error	T-Value
(Constant)	0.243	0.116	2.101
Park Access	0.086	0.080	1.070
Aesthetics	0.175	0.094	1.854*
Cost Efficiency	0.071	0.088	0.804
Park Security	0.104	0.030	3.464***
Park Biodiversity	-0.017	0.037	-0.444
Park Layout	0.164	0.037	4.391***
F-Value: 8.665***; R-Squared: 0.351; Adjusted R: 0.311 * and *** represent 10% and 1% probability levels respectively; Source: Field Survey, 2019			

Conclusion

Based on the findings of the study, it can be concluded that, majority of the respondents were single and within their active ages. The study also showed that majority of the respondents had tertiary education and a high visit rate to parks with due accessibility. However, the estimate of the multiple linear regressions showed that pocket park enjoyment is dependent on the following variable such as; Park access, Aesthetics, Cost efficiency, Park security, Park biodiversity and Park layout as other variables are glued to these. The findings revealed show that majority of problems leading to the ineffectiveness of parks, and patrons refrain from parks is due to three of the analysed variables; insecurity, lack of aesthetics and poor park layout.

Recommendations

The study recommends the following:

- ✓ Government should create an enabling environment for the safety of patrons as the level of insecurity poses threat on the lives of park users' because of the fear of open gathering and happenings due to bomb blasts and insurgency common around the Jos metropolis.
- ✓ Government should develop a strategy to provide a means of high-tech security surveillance.
- ✓ Adequate funding should be appropriated for the re-structuring, implementation and management of pocket parks from government at various levels.

Summarily, to support and improve public health, varied actions are required by local administrators and policy makers. Within this field creating healthy urban environments is an important contribution. Considering the high level of global urbanization urban parks are imperative for maintaining and improving public health. Pocket parks have great potentials that are not yet fully optimized by local governments. It is hopeful that more attention is drawn towards embracing them in improving the city open space holdings, and thus increasing the opportunity of a better quality of life for its dwellers.

Conflicts of interest: The authors declare no conflicts of interest.

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