

### **Antecedent and concession of a plan: the recreational facilities integration**

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#### **Abstract**

The spatial provision of recreational facilities is highly critical. This study aims at assessing the provision and integration of recreational facilities in the Greater-Jos, Nigeria. The effectiveness of policy implementation is determined based on the aspects of accessibility, appropriateness, and performance of stakeholders in the provision of recreational facilities. Multi-method research was adopted where Geographic Information System (GIS), and interviews were conducted. The data were analysed by using ArcGIS, and Atlas.ti8, respectively. By triangulation, the results revealed that the implementation of recreational facilities positively affects the relationship among accessibility appropriateness and stakeholders' involvement. The findings further show the spatial distribution of the recreational facilities, which are unequally spread within the ten sectors of the Greater Jos. Relating the results to the policy proposed in the Greater Jos Master Plan produced in 2009, the findings are astonishingly conflicting. The implication of is that the policy required revision to account for the new development areas spring up rapidly as well as comprehensive recreational facilities supported by government agencies and private providers.

**Keywords:** Plan, Recreational Facilities, Provisional Mechanism and Integration

## Introduction

A plan consists of factors that influences the provision of recreational facilities, thus, facts produced from literature. Terzi, Turkoglu, Bolen, Baran and Salihoglu (2015) studied supply and demand recreational facilities in a city. They were able to identify the vital characteristics of a plan and provision of recreational facilities as accessibility, affordability, equality, quality, quantity, size, people attitudes, perceptions and behaviours, supportive infrastructures, inclusion of various age, ethnic and racial groups, and design quality.

The system behind these recreational experiences is the dependent on related variables as demographic characteristics, recreational quality of the recreational facilities and more forms of visits to the facilities. This also serves as guide to accommodating the increase in participation of recreational activities, but due to urbanisation the natural resources became scarce with few features to harness. An ideal proximity to the participants of the recreational activities is crucial in considering siting of the facilities for best usage. The challenges are achievable by considering the spatial design of recreational facilities by category through city, sub-regional, regional, and national to international capacities. Thus, blending the appropriate categories and quantities of the elements; younger age groupings. Consequently, the design for the urban recreational areas and enhancement of adequate provision is towards integrating the various age groups (Fadamiro & Adedeji, 2014; Gabdrakhmanov & Hosseini, 2019). Jos is said to be one of the oldest (first generation cities in Nigeria) and that developed over the 100 years. The ever increase in population led to competitiveness of the demand for land for all purposes, most especially for the recreation. The city in earlier development experiences the entry of people from different parts of Nigeria because of the railway line which was constructed in 1937 (Dung-Gwom & Rikko, 2009).

## Literature review

### *Provision mechanism*

The potential needs and difficulty of the public provision of recreational services makes it imperative to plan the distribution of recreational facilities, which is of relevance to communities (Song et al., 2020). Recreation facilities provide citizens with opportunities to experience the available activities, thereby considering new spaces and public lands for the purpose to meet increasing demand (Gidlow et al., 2019; Rottle, 2016).

The environmental justice in provision is somewhat a new topic in recreational services literature. Undesirable or unequal provision of environmental facilities and distribution issues rarely considered in environmental planning. For instance, the public recreation opportunities provided, only benefits the high income group in the society (Maia et al., 2020). Within the environment, access to recreational facilities and public open spaces are basically for physical activity. Studies were centred on the provision, accessibility, usage, and categories of the recreational facilities be it passive and active, as well as encourage walking to the locations (White et al., 2018). A critical issue is an environmental injustice, where minority group and low-income people could have an easy reach to the facility areas to others of highly privileged (Mullenbach et al., 2019; Rigolon, 2017).

Policies and guides to planning with legislative principles are necessary for consideration, such as location of the facility, capacity of the services, accessibility to the site and demographics, as well as the potential socio-economic and environmental impacts. Likewise, equity, availability, engagement, integration of cultural significance, quality, efficiency and effectiveness, and fairly flexibility are significant factors to behold (Davies & Laforteza, 2017). The elements mentioned above and many more as biodiversity, aesthetic, and usability do resolve residents perception of the space (Yu et al., 2018).

#### Accessibility of recreational facilities

Accessibility examines the degree of ease by which people can access the recreational facility. One of the most often objectively way to assess accessibility is centred on the gravity potential model, which is a function of travel cost from an origin of the facility to all destinations possibly considered (in other words a distance decay function). Besides that, is the enhanced two-step floating catchment area method, which is uncomplicated to use. It differentiates between areas with similar numbers of facilities serving different population densities, hence providing a better realistic impression of accessibility to services especially the recreational facilities (Jiao et al., 2015; Mavoa et al., 2019).

Geographic Information Systems (GIS) is used to evaluate the adequacy, accessibility, and equitable distribution of recreational facilities to the population, thus determining indications on the issue of adequacy of recreational facilities provision. Also, network analysis is used to measure levels of accessibility to walking and mass transportation. While socio-economic characteristics of the population are evaluated to determine the extent of equity in the provision of recreational facilities in the cities. This aids planners to adequately evaluate the existing and strategies for new cities. Hence, accessibility is a measurable component that is a level of opportunity given to relate with a certain trend that is directly proportional to the resources given and in this case the recreational facilities (Gidlow et al., 2019; Tu et al., 2018).

To expand further, accessibility is associated to geographical locations which is the physical closeness of the recreational facilities, which is better assessed using the GIS analysis tools. Otherwise, effective accessibility incorporates other aspects, as the quality, appeal, and affordability of the recreational facilities. More components with regards to this indicator are collected through surveys such as satisfaction, desirability and opportunities for participants (Arranz-López et al., 2019; Larson et al., 2016).

The recreational sites that is proximity to or within the neighbourhood inspire people to visit and participate actively than the sites that are of distance. This is not unconnected to time and financial capacity needed to go to the recreational site. It is then suggested that the far the recreational area, the patronage to the recreational area decrease and the other way around. Though, there is no common standard about the distance of recreational facility area to a neighbourhood, notwithstanding, a realistic distance of not more than one kilometre is ideal for recreational services at the local level, while the distance at a national and regional may depend on the participants choice (Khaza et al., 2020).

### Appropriateness of recreational facilities

The choice for the type of activities, and what characteristics of recreation an individual persuade influences various types of activities. The concern is where the needs of the people and circumstances of the provision are not reasonably correlated, or evenly distributed to the desires of the individuals do lead to dissatisfaction (Gao, Song, Zhu, & Qiu, 2019). This is achieved by assessing the degree of accessibility and equity of the facilities. Some elements are essential influence urban system to work equitably the facilities accessible. These two specific factors been the indicators through which the assessment is made to process toward improving the inhabitants' quality of life (Rabe et al., 2018).

**Availability Factor:** Availability of facilities is determined by the existence of equipment within the defined recreational facility areas. The environment influences the existence of harmonizing facilities that help effective participation of the recreational facilities (Lee, Macfarlane, & Cerin, 2013). The presence of the recreational facilities in an area also attracts the need and desire to recreate. Furthermore, the lack or insufficiency will decrease the desire and ability to participate in recreation. Recreational opportunity and accessibility are also a function of age as various age group needs a variety of recreational facilities for effective participation. The availability of the facilities also influences the choice of recreation among races and age group's favourites (Kimpton, 2017; Metin et al., 2017). Also, religion as linked with recreational opportunity of American Muslims, the scenario among women decreases recreation (Mowen et al., 2018).

Additionally, the increase of the availability of recreational facilities and leisure services influences recreational activities. Also, the characteristics of the recreational facilities for a variety of capacity of recreational areas matters in meeting various recreational needs of the populace. Hence, the categorization and qualities of the recreational facilities (Evenson et al., 2016). In categorising the facilities, area coverage were used in the state of Indiana, USA, for instance the outdoor recreational areas are classified into five being the block parks (0–2,000 m<sup>2</sup>), neighbourhood parks (2,000–20,000 m<sup>2</sup>), community parks (20,000– 160,000 m<sup>2</sup>), district parks (160,000–400,000 m<sup>2</sup>), and regional parks (more than 400,000 m<sup>2</sup>) (Hoang et al., 2019; Kothencz et al., 2018).

Provision of the adequate recreational facilities to threshold is the vital sole responsibility of the planners and various providers, private or the government agencies. Though, having contemporary recreational areas with the capacity to meet the various recreational needs of the people is a great task particularly in urban areas where there is a speedy rise in population growth and urbanization (Leon-Moreta et al., 2020; Turner et al., 2018). The provision of recreational and sporting facilities should be sufficient to meet the diverse needs of local communities and support a range of activities for all age groups, now and into the future (Lee et al., 2013; Nath et al., 2018; Rusanov, 2019; Yli- Pelkonen, 2013).

**Aesthetics:** Generally, recreational facilities are made to be desirable and low-cost for most of its participants. The plan landscape components other related facilities for the recreation should be centred on affordability and accessibility of the people of the community. Hence, aesthetics assesses the pleasantness of the facilities, particularly, elements like the trees, flowers, natural sights, etc. But does scare-off people if the facility area is an eyesore and having obnoxious smells (Elwell et al., 2020; Hermes et al., 2018). The residents

of a community contented with recreation services if the facilities and environment meet their desired needs. The pleasantness also considers some planning and design elements such as functionality, population characteristics, socio-economic and cultural factors, good maintenance culture and residents' patronage of the facility. This enables better recreational provision and promotes benefits, which can be achieved regionally. The necessity of cities is to help provide recreation opportunities, and the ability to improve recreation provision which is affordable as well as being effectively operational (Douglas et al., 2018; Tu et al., 2018).

Recently planners are concern about the inequality of resources in the suburban areas, having acute social inequality of population class and area exclusion. Hence, the crucial need to continually examine the equal opportunity theory that includes the city and its environs located within a given area (Frenkel & Israel, 2018). Equal opportunity can as well be related to attitudes of redistribution, considering the possible kinds of inequality that deterred the growth of development are connected to the liveable settlements with equal opportunity (IEP, 2019; Xing et al., 2018).

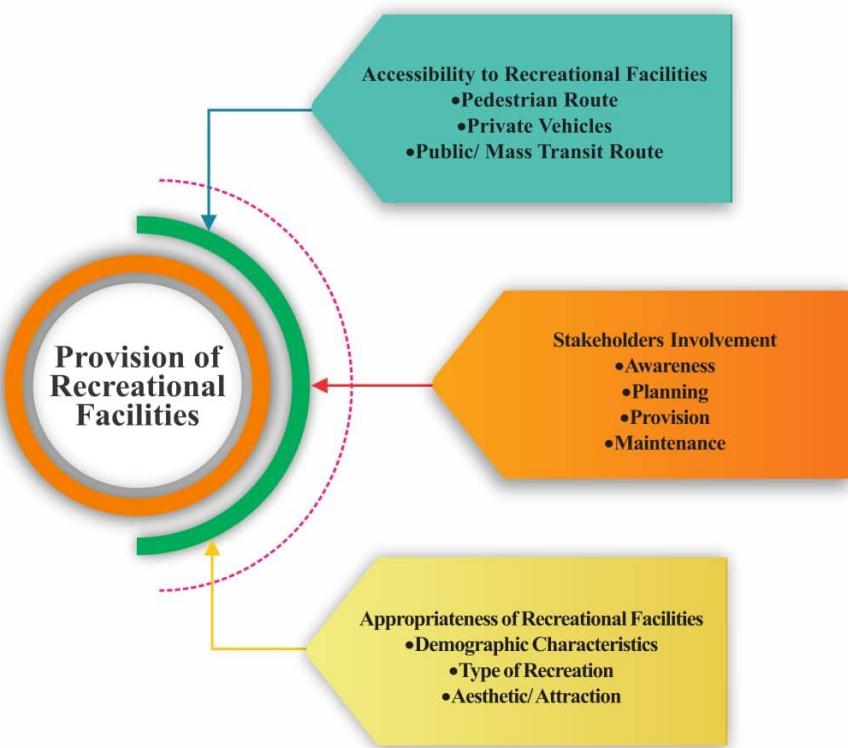


Figure 1 Conceptual Framework

From the above derivations (Figure 1) of indications, they substantially been coarse to form the variables of the study, hence, the framework. This framework would be developed to investigate the bases of the provision gap to the recreational facilities in the Greater-Jos, to be well informed of the issues and offer possible policy solutions to tackling the problems regards to the recreational facility provision. The literature has a strong impact in supporting the objectives earlier spelt out. The proposed conceptual framework includes elements of the independent variables also known as exogenous variables and the dependent variable also known as endogenous variable. The independent variable is also known as the explanatory (manipulated or controlled) variable. This includes Accessibility to recreational facilities, Adequacy of recreational facilities, Appropriateness of the recreational facilities, Stakeholders' involvement in the provision of recreational facilities. Whereas the provision of recreational facilities gap is the dependent variable, also known as the output (explained or measured variable).

In conclusion, the determination and Identification of needs of recreation facilities are considered into High, Medium, and Low priorities as been centred on all the information available for this study (City of Laguna Hills, 2009). Recreation and sports should be accessible to all and encourage people whose participation are known to be lower. In as much as communities desire access to the natural environment and open space for recreational opportunities, there is a need for conservation and preservation of ecological habitats. Emphasis on recreation and sport needs to be emphasised for a healthy and meaningful lifestyle (Anne, 2016).

## Methodology

This is the procedure implored and steps taken to accomplish the research, such as the source of data, type of data to be collected, method of data to be collected, sampling technique and data analysis. Multimethod consisting of the main elements and their attributes will be used to assess the provision of recreational facilities in Greater Jos. These methods implore the use of Geographic Information System (GIS) (Lahoti et al., 2019).

The research employed the multi-methods. This includes review of the literature, collection and analysis of existing survey data, field notes, observation, and interviews. The primary (qualitative) data collection will be involving GIS survey within the ten sectors to identify the available recreation facilities in the study area. The other qualitative method would involve the use of interview, where the providers being the informant would be engaging in answering an open-ended question with regards to provision of the recreational facilities.

The GIS-based spatial statistical approach shall determine accessibility with regards to equity. So also, to ascertain the spatial location of the recreational facilities. The results of this study expect to offer a practical understandings and implications which will, in turn, be valuable to the people of Greater-Jos. Also shows spatial variants in the map-based and statistical results on some concerned variables like the accessibility, adequacy and the appropriateness of the facilities provided. And of course, the usage or patronage which determines the awareness of the residents, and adequacy of the facilities.

### ***Research design***

The study evaluates changes in one dependent variable that hypothetically resulted from manipulations of 14 independent variables. This is a multimethod study, assessing the implementation of the provision of recreational facilities for proper integration conducted in Greater Jos, Nigeria.

The most valuable and related study is referred on the quality of the urban environment and human wellbeing depicting from a social ecological perspective (El Karim & Awawdeh, 2020). Nearest neighbour search, which not only serves as a fundamental sub-problem in many more sophisticated algorithms but also has direct applications, such as image retrieval and image clustering. This has direct applications in numerous areas, such as information retrieval, pattern recognition, databases and data mining, image and multimedia search (Liu, Rosenberg, & Rowley, 2007).

Though studies suggested that stakeholders could be classified into four different groups:(1) government officials; (2) private company officials or entrepreneurs; (3) local community; and (4) interested groups such as non-government organisations (NGOs). In this study, information about the provision of recreational facilities was obtained from four government agencies: the Jos Metropolitan Development Board (JMDB) and Plateau State Ministry of Lands, Survey and Town Planning in March 2019. This was followed in Nigerian Tourism Corporation and Plateau State Sport Directorate. Other sources were private operators (Non-governmental).

### **Findings**

The qualitative phase of the GIS method comprising of identification of the location (inventory), mapping, data analysis and findings. Stakeholders' information were used to examine, identify and seek opinions on the effectiveness of the provision of recreational facilities in the study area (figure 2).

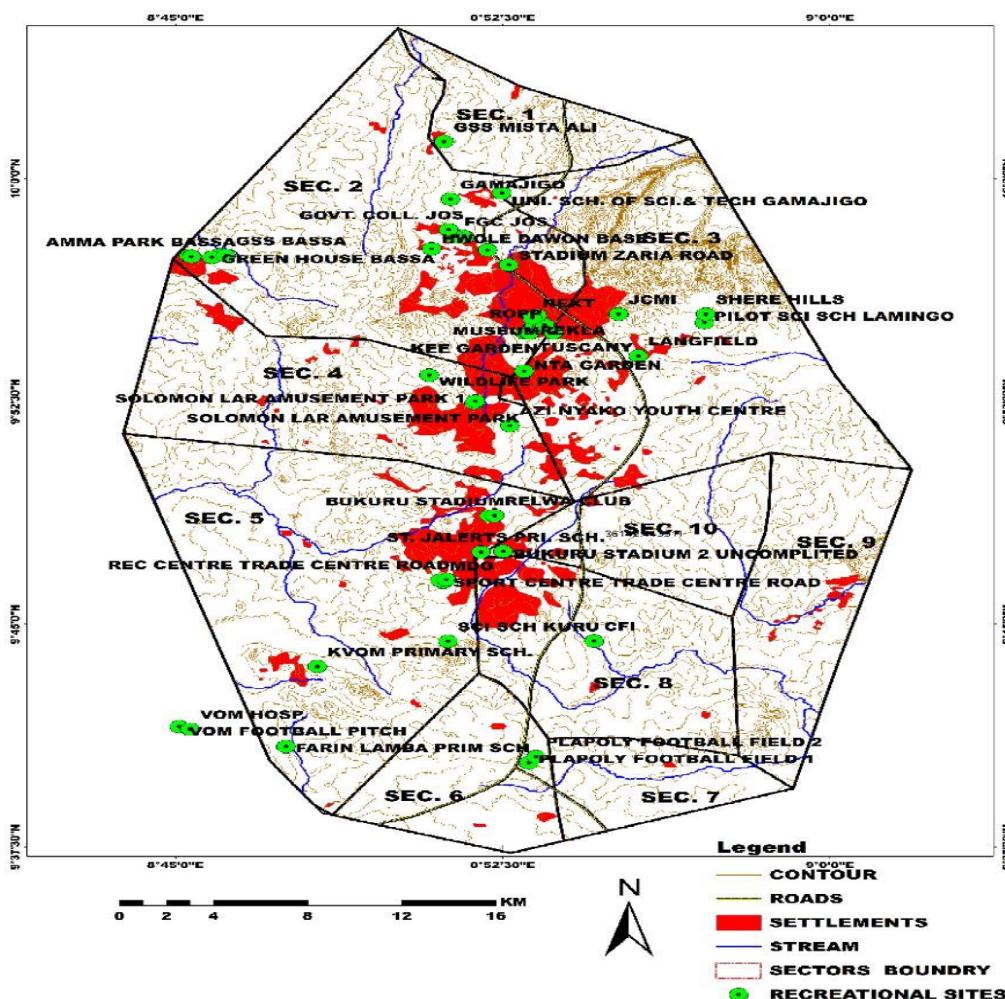


Figure 2 Distribution Recreational Facilities of Greater Jos

The null hypothesis of CSR is tested using the Z statistic (standard normal variate). By rule of thumb, a negative Z score indicates clustering while a positive score indicates dispersion or evenness. The above-computed value of Z score shows negative, which means the locations or distribution of the facilities are clustered. This fact reflected the visual presentation on the map with the average distance of 2015.6 metres indicating dispersal of the provision of the recreational facilities. However, it can be seen that it is practically within the core city.

Table 1 Average Nearest Neighbourhood

Average Nearest Neighbour Summary for Popular Public Recreational Facility	
Observed Mean Distance	1969.3188 Meters
Expected Mean Distance	2015.6334 Meters
Nearest Neighbour Ratio	0.977022
z-score	-0.228412
p-value	0.819326

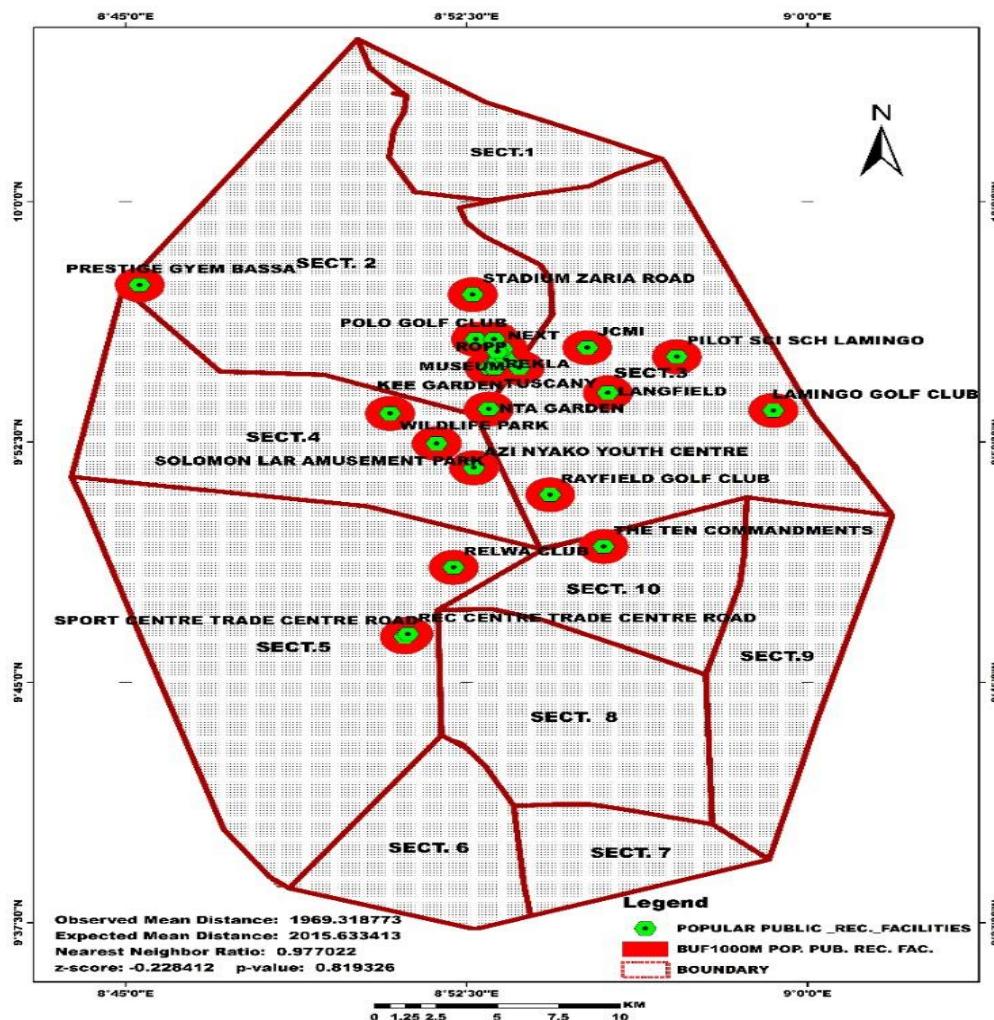


Figure 3 Recreational Facilities using 1km buffer

The analysis using 1,000 metres buffer (figure 3) shows that the distance coverage is isolated and at the outskirt of the central area but clustered the city centre. This indicates uneven distance coverage by walk to the recreational facilities within the Greater-Jos. However, it is practically absent in the sectors at the outskirt, and barely available in some sectors.

### ***Plan antecedent***

Vision for the provision of recreational facilities is highly important because whatever concept that the Greater Jos Master Plan gives is leveraged to have a well let out recreational facilities. The master plan was supposed to contain where the vision lies principally. The model sectors, which were contained in the proposal for the provision of the facilities are expected to be provided to standard. This entails the neighbourhoods and types of recreational facilities therein. The provision for the recreation facilities is a long-term plan because it is set out for 25 years in the Greater Jos Master Plan, which unfortunately is due for review and is yet to pass into law. Implementing it would be an ideal thing that spelt out in the sectors types and hierarchy.

Jos Metropolitan Development Board (JMDB) deliberately identified locations mostly in line with the master plan where they deem fit within existing settlements for government to acquire and, then provide some of the facilities so that neighbourhoods will have facilities for children and adults. The aim of the provision cannot be achieved when the government is lacklustre in this regards.

*“Other African countries have gone a long way and, most of the high-end revenue is from that aspect, but ours not doing we’re not into tourism. They just pay lip service and, that’s all so whether you draw out a goal and objectives is all to rubbishness, because nobody will even do anything with it. But, hoping that it will have a listening government and then, they will provide money”.*

The agencies of government do regularly write reminders informing the authorities about the need for the provision of the facilities but to no avail. The acceptance of the plan for the provision and funding lies in the hands of the authority.

Future Plan of Provision: The plan depends on the legislation on the Greater Jos Master Plan with regards to how well it serves demographic, appropriateness with regards to assembly and evaluation of existing facilities. It is expected that when this law comes into effect and, the government considers it, then it will achieve its purpose. At the moment, there are no other active plans.

*There was a proposal to host international camping group who at the age bracket of 18 to 25, it recorded low patronage because the information was not well disseminated and as well as the insecurity contributed.*

The plan from the agencies and organisations with projects for recreation are targeting a long-term strategy that is social and economically viable.

*“There’s one at Shere hills which they showed interest, then the Marraraba side. They also wanted to go further to the Inland, but the present government didn’t show interest. ABC shelters was a foreign company involving Americans, Indians and some Asians that showed interest”.*

Plateau State entirely is blessed with good weather like that of Europe, where the natural potentials for recreation need can be harnessed. Considering this opportunity into reality, Greater Jos will stand out in Africa, but for the commitment of the government to provide funds for this long-time project. Furthermore, the available facilities are in the core city of the State instead of spreading to the grassroots.

### ***Stakeholder participation***

The stakeholders do participate in facilitating the provision of the facilities, atimes being part of a team of a committee to work on some recreational activities included in the plan. While some engage in organising outdoor recreational activities and, places where people occasionally come for 30 days, come for weddings, picnics and, trying to grow the business through the stage to stage.

*"In fact, if need be either as a stakeholder in that plan. Oh as a personal developer. I wish to develop a recreational facility that will attract visitors to such a centre."*

*"Well, I have personally run a recreational centre as a government worker for about 14 years, and that is the international tourism centre. So I'm highly experienced if I'm opportunity to run a personal one. I think I'll be able to meet up with the immediate requirement by the clients of the beneficiaries of such recreational centre".*

*"Using it, maybe I could manage it till March- April but all the people around me. They come to fetch the water. Sometimes they even fetch in the early hours of the morning before I come and I end up not getting any water. So I've dug three wells, but I'm getting small from one".*

Amongst the problems face by the stakeholders are space for those recreational activities, for instance, distance should also be considered so that people living in Zaria road need not come to Wildlife Park for events. This brought about doing activities in unconventional ways, a times in schools, which doesn't all go well for such events.

### ***Funding***

The prospective operators hardly secure loan to develop the space for the recreation, for the fact that most of the recreational facilities are capital intensive. The reason for applying for a bank facility or a loan elsewhere is for the business to grow, but the banks hardly support such ideas of a project. The main problem is the funding, lack of finance crippled the efforts in the provision and operation of recreational facilities. For instance, the main bowl of the stadium, the roofing of the stadium is yet to be completed. Issues confronting the provision of recreational facilities are funding, hence affecting the operation of the existing facilities.

*"For Greater Jos Master Plan we picked some areas and wanted them.... What funding was not there, and so we could do anything".*

Also, the issues of maintenance which requires funding usually come from government. Sometimes it is not forthcoming, while sometimes it would not be regular and sometimes nothing throughout the year. This necessitated the undergrowth of the provision and the operators incapacitated, which affects patronage and

participation in the recreational activities. The visitor faced with disappointment in terms of choice and dilapidation of the available facilities.

### **Promote tourism development**

Private sectors are partners in progress with government and, there should be parks whereby visitors from outside the countries and within the States could come for holidays, but none at the moment.

*"A foreign investor known as ABC Shelters (a foreign company involving Americans, Indians and some Asians) came with a laudable presentation to the government for the operation of some recreational facilities, as the Kura falls to the National tourism site. Also interested in Genco one, then Genco two, Genco three and the generating plants which are potential tourism areas, but yet to be developed".*

There is another site at Shere hills which they also showed interest, together with that of Marraraba Jama'a side. The intention was to further the space to the Inland, but the present government do not show interest in the investment, and so the effort was thwarted.

### **Recreation provisions**

Meeting the standard expectations suitable for providing recreational facilities is the focus here. Inadequate Provision; Issues confronting the provision of recreational facilities is funding, and it is a hindrance for the personnel to manage the recreation centres.

*"The provision, the available ones are not enough. A big city like Jos needs more recreational areas because sooner than later like immediately before the rainy season comes you start seeing events coming and most of the events. You will find out that they are not enough to contain all these".*

Considering the different activities like the passive and active recreation are lacking presently, with only one stadium and the new one is still under construction is a pathetic situation. Thus, compensation of the land has not been done, and the landowners are on the neck of the government to pay them, or they would take over their land.

The Wildlife Park and Zoo belonging to the state and federal governments respectively are being run by the governments and so the lackadaisical behaviour in managing the facilities. This is the reason private individuals having the interest to develop them and would make provision of all sorts of animal available. It is coupled with the fact that the existing facilities that government-provided are grossly inadequate, only the inherited ones over the years are available. Government has not deliberately made provision especially within the neighbourhoods and, with the pace of development.

The agency (JMIDB) deliberately identified the areas to get space for the government to acquire, if not individuals may find it very difficult to acquire space in such areas. There has to be a budget because, largely, there is over-concentration of the facilities within the central areas to the detriment of the neighbourhood and, the available ones are not to the required standard.

*“So in most cases, there are difficulties that are associated with developing recreational facilities and most of which are issues of security and roads network, while some are the issues of the provision of electricity, and most especially in this modern poor or no internet facilities and insufficient network coverage. So some visitors will be scared of moving to such places. So these are some of the difficulties associated with recreational facilities in certain areas”.*

### **Insecurity issue**

Insecurity is a serious issue in Greater Jos which hampered development of all sorts, hence affecting the provision of the recreational activities. The incessant tribal and farmers-herders attack marred recreational activates so seriously. The whole town need to be secured, where both young and old will be safe and have a sense of belonging to participate in activities that will rejuvenate their spirits. The unending killings in Jos scares-off investors and visitors that would like to go out to enjoy the recreational facilities. The crises led to the establishment of the Peace Building Agency.

*“And also another thing is that issue of insecurity in such areas. Sometimes the influx of visitors or beneficiaries will be low because they are scared of the area”.*

A proposal to host International camping group age bracket of 18 to 25, recorded low patronage, reason that it was affected by the incessant ethnoreligious crises, which led to the stoppage of hosting the camp up till date.

### **Need new technology**

The dynamic of the world goes with changes and taste, events also change, and so individuals recommend the elimination of the obsolete facilities in the system. Hence, the projection for an update for technological changes proposed for the next five to ten years. Also, there is hope that as time goes by the system would be up and doing.

*“Well, as time goes on, some are not in good shape should be removed so that it would be part of the plan”.*

There is the quest for new recreational facilities of all kinds as can be seen elsewhere like in the developed world. There is the need to advance a lot of facilities which the agencies are planning to achieve in a piecemeal, as well as developing gradually other facilitating services like water and land which are challenging issues. It would be easier to attract visitors from all walks of life to participate and also patronise social, recreational facilities wherever it is located.

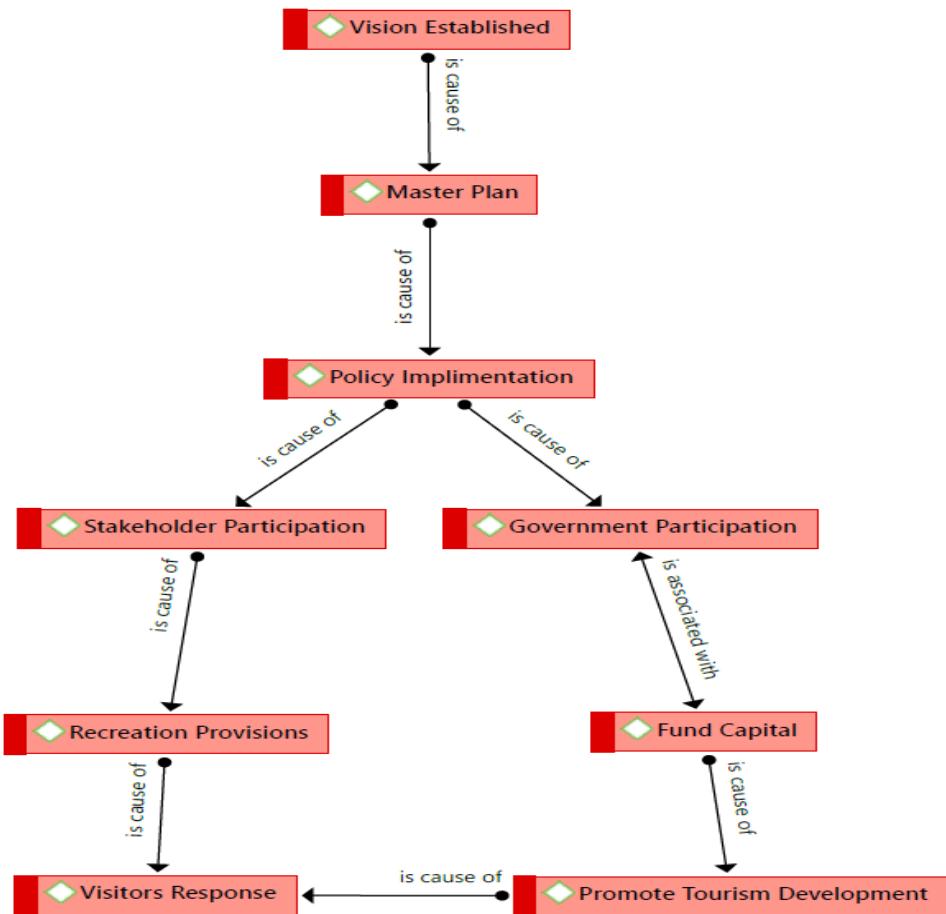


Figure 4. Thematic Network of Plan for Recreation

Table 2 Validation of Recreational Plan Data

Show codes in group Plan				
Name	Grounded	Density	Groups	
● Fund Capital	15	3	[Plan]	
● Government Participation	10	2	[Plan]	
● Master Plan	26	2	[Plan]	
● Policy Implementation	10	3	[Plan]	
● Promote Tourism Development	10	2	[Plan]	
● Recreation Provisions	34	3	[Plan]	
● Stakeholder Participation	9	5	[Plan]	
● Vision Established	4	1	[Plan]	
● Visitors Response	6	2	[Plan]	

### **Thematic and validity**

The thematic network (figure 4) is the visual presentation of this variable which shows flow, connections and understanding of each of the attributes as presented in the text. The table focuses on the validation of the findings, more so that, the genuineness of any research is the validation of the main findings. It expresses the novelties and contributions to the body of knowledge in the research by considering the criteria of a qualitative approach. It substantially contributed to the study in assessing the plan for recreational facilities with elements of funding, government participation, Master Plan, policy implementation, promote tourism development, recreational provisions, stakeholder participation, vision established and visitors' response. By rating the provision of recreational facilities provisions, it tends to have the highest occurrence of 34 times contributory factor based on the number of appearances (grounded), while stakeholder's participation has the highest attributes in terms of linkages (density). It is worthy to note that other variables that do not make substantive contribution were deleted, while others of the same category were merged to make a significant effect.

### **Discussion and conclusion**

The findings give a clear picture of the provision of recreational facilities in the Greater-Jos, and their effects on the social life of the area. Firstly, with regard to the distribution of recreational facilities, the findings, as shown in figure 1 captured the catalogue of recreational facilities available. Hence, a rather lopsided distribution of the organised facilities contrary to the policy. A similar research by Kubota et al. (2019) found that there was an appreciable rate of responsiveness to participation in physical activities due to the intervention of the provision recreational facilities in the community. Also, the findings by D'Antonio et al. (2012) supported by observing that lack of access and ability to walk from home is already a source of concern among the residents,

because of unequal distance in the distribution of the recreational facilities. In similar research by Powers, Lee, Pitas, Graefe, & Mowen (2020) they demonstrated that as marginalized individuals increases, they are less likely to visit parks owing to the fact that they have the facilities within walking distance. Though, experience of marginalization is said to be common against side-lined groups. Also, with regard to the appropriateness and quality of recreational facilities, as shown in table 5.1 and figure 28 determined few organised facilities that is inadequate to meet with the demand of the ever-increased population.

Concerning the benefits of recreational facilities integration in the society, the findings inferred that recreational facilities were of great significance to the social life of the residents. A similar research by Eigenschenk et al. (2019) found that recreational facilities, most especially those related with outdoor recreation, have a high impact on the social life of a community. In addition to appropriateness Lo & Jim (2012) argued further that recreational areas are valued more for their benefits than for any other social environmental benefits, most especially the greens. With regards to the stakeholder's involvement table 5.1 shows the inventory of the facilities depicting high proportion being privately owned and run at small scale with the few owned and by the agencies of the government are run at higher (Complex) level. This finding is liking to that of Kothencz, Albrecht, Hölbling, Pürmayr, & Osberger (2018) who provided the impact of the stakeholders on the provision of recreational facilities in a community in terms of social integration. This involves and informs the appropriate stakeholders and decision makers in Salzburg that are already in the conceptual stage and contribute to the citizens' quality of life. In the same vein the study of Hjort, Martin, & Troelsen (2019) showed how knowledge, skills and values from other field of disciplines and active research are brought forth toward advancing the decision-making process in sports and recreational provisions. This involves the stakeholders in taken ownership of the plan outcome, which is different with the system in the Greater Jos where decision emanate from the government being the politicians as captured in the 5.5.2. Therefore, the governments need to look beyond policies but lead in the provision of recreational facilities to meeting the need of the communities of the Greater-Jos that now expands progressively from the core city of the two-local government of Jos-North and Jos-South to the other four local governments that now make up the Greater-Jos.

### ***Contribution to methodology***

No one approach can be said to be adequate and or perhaps substantive for producing a result 100 percent to reckon with. Though the choice of an approach must have a philosophical background to determine fitting. This study adopted Multi-Method based on the uniqueness of the research and the paradigm shift in approach to arrive at an acceptable answer adequately and substantially to the issue at stake. The methods adopted are GIS (mixed method), and Qualitative method.

The GIS contributed to the production of the inventory of the available recreational facilities in the study area. This would be the first document to contain a substantial display their positions (location) which determines the distance between facilities. This helps to determine the accessibility, the appropriateness and involvement of the stakeholders. Thus, the findings are compared with the existing situation to verify the implementation of the policy, which reveals the deficiencies that bids for solution.

Secondly, the qualitative is hinged on assessing the provision of recreational facilities based on the providers' perspective. The finding from the interview shows more facts from the proceeding methods, being open ended questions there is little or no restriction to the extent of response from the informants.

Therefore, the thematised structure gives credence to the volume of information gathered toward integrating the facilities by determining the accessibility, appropriateness, stakeholders' involvement and the policy and strategy guiding the provision of the recreational facilities. The duo approach is a novel in this area of study which is quite revealing with regards to finding of facts, knowledge and understanding of the system of the provision of recreational facilities.

### ***Practical implication***

With regards to the plan, the integration of the recreational facilities has suffered a setback considering non implementation of the policy and strategy as captured in the Greater-Jos Master Plan report of 2009, being the only document that contains policy and strategy for the provision of recreational facilities. Therefore, this study will be of benefit for the government and other private providers to consider as a current document for use to correcting the inadequacies of the practice and non-adherence to the policies as captured in the master plan with regards to the provision of recreational facilities in the Greater-Jos.

### ***Suggestions***

The findings of this study found out that the provision of the recreational facilities is contrary to the policies and strategy as documented in the plan (Greater-Jos Master Plan). The issues and possible policy solutions that emerged from observation, the data were computed via GIS survey and validated by the principles of buffer in the ArcGIS computation relating to literature and document on Greater-Jos. This serves as a reference point to confirmation of the authenticity of the findings. The qualitative finding from the interview reaffirms the inequality of the distribution of the recreational facilities, hence, the solution suggesting the neighbourhood provision of the facilities. The government and private individuals' role in the provision and distribution of recreational facilities cannot be over-emphasised through the implementation of these practicable policies with an acceptable programme of action (Policy and strategies) to address the gap in deficiency and eventual integration of the facilities.

### ***Limitations and further research***

First, this study only focused on the provision (distribution) of recreational facilities in the Greater-Jos and conducted a face-to-face interview for only seven informants. Therefore, further studies should investigate critically each facility with their attendant facilities for effective integration (water, electricity, road, and landscape) within the Greater-Jos.

## References

- Arranz-López, A., Soria-Lara, J. A., & Pueyo-Campos, Á. (2019). Social and spatial equity effects of non-motorised accessibility to retail. *Cities*, 86(May 2018), 71–82.  
<https://doi.org/10.1016/j.cities.2018.12.012>
- City of Laguna Hills. (2009). *Recreation Facilities Needs Assessment* (Issue April).
- D'Antonio, A., Monz, C., Newman, P., Taff, D., & Lawson, S. (2012). The Effects of local ecological knowledge, minimum-impact knowledge, and prior experience on visitor perceptions of the ecological impacts of backcountry recreation. *Environmental Management*, 50(4), 542–554.  
<https://doi.org/10.1007/s00267-012-9910-x>
- Davies, C., & Laforteza, R. (2017). Urban green infrastructure in Europe: Is greenspace planning and policy compliant? *Land Use Policy*, 69(September), 93–101. <https://doi.org/10.1016/j.landusepol.2017.08.018>
- Douglas, J. A., Briones, M. D., Bauer, E. Z., Trujillo, M., Lopez, M., & Subica, A. M. (2018). Social and environmental determinants of physical activity in urban parks: Testing a neighborhood disorder model. *Preventive Medicine*, 109(2017), 119–124. <https://doi.org/10.1016/j.ypmed.2018.01.013>
- Dung-Gwom, J. Y., & Rikko, L. S. (2009). Urban Violence and Emerging Land and Housing Markets in Jos, Nigeria. *ISA Housing Conference*.
- Eigenschenk, B., Thomann, A., Mcclure, M., Davies, L., Gregory, M., Dettweiler, U., & Ingl, E. (2019). *Benefits of Outdoor Sports for Society . A Systematic Literature Review and Reflections on Evidence*. 1992. <https://doi.org/10.3390/ijerph16060937>
- El Karim, A. A., & Awawdeh, M. M. (2020). Integrating GIS accessibility and location-allocation models with multicriteria decision analysis for evaluating quality of life in Buraidah city, KSA. *Sustainability (Switzerland)*, 12(4). <https://doi.org/10.3390/su12041412>
- Elwell, T. L., López-Carr, D., Gelcich, S., & Gaines, S. D. (2020). The importance of cultural ecosystem services in natural resource-dependent communities: Implications for management. *Ecosystem Services*, 44(May), 101123. <https://doi.org/10.1016/j.ecoser.2020.101123>
- Evenson, K. R., Jones, S. A., Holliday, K. M., Cohen, D. A., & Mckenzie, T. L. (2016). *Park characteristics , use , and physical activity : A review of studies using SOPARC ( System for Observing Play and Recreation in Communities )*. 86, 153–166. <https://doi.org/10.1016/j.ypmed.2016.02.029>
- Fadairo, J. A., & Adedeji, A. J. (2014). Recreational experiences in parks and gardens, Ibadan, Nigeria. *Journal of Place Management and Development*, 7(1), 5–26. <https://doi.org/10.1108/JPMD-11-2013-0023>
- Frenkel, A., & Israel, E. (2018). Spatial inequality in the context of city-suburb cleavages—Enlarging the framework of well-being and social inequality. *Landscape and Urban Planning*, 177, 328–339.  
<https://doi.org/10.1016/j.landurbplan.2017.02.018>
- Gabdakhmanov, N., & Hosseini, S. (2019). Site Location and Construction of Ski Resorts Using Geographical Information System (GIS) in Isfahan Province. *IOP Conference Series: Earth and Environmental Science*, 272(2). <https://doi.org/10.1088/1755-1315/272/2/022013>
- Gao, T., Song, R., Zhu, L., & Qiu, L. (2019). What Characteristics of Urban Green Spaces and Recreational

Activities Do Self-Reported Stressed Individuals Like? A Case Study of Baoji, China. *International Journal of Environmental Research and Public Health*, 16(8), 1348.

<https://doi.org/10.3390/ijerph16081348>

Gidlow, C., Cerin, E., Sugiyama, T., Adams, M. A., Mitas, J., Akram, M., Reis, R. S., Davey, R., Troelsen, J., Schofield, G., & Sallis, J. F. (2019). Objectively measured access to recreational destinations and leisure-time physical activity: Associations and demographic moderators in a six-country study. *Health & Place*, 59(July), 102196. <https://doi.org/10.1016/j.healthplace.2019.102196>

Hermes, J., Albert, C., & von Haaren, C. (2018). Assessing the aesthetic quality of landscapes in Germany. *Ecosystem Services*, 31, 296–307. <https://doi.org/10.1016/j.ecoser.2018.02.015>

Hjort, M., Martin, W. M., & Troelsen, J. (2019). Planning of sport and recreational facilities informed by interdisciplinary knowledge: An attempt to make a systematic and transparent design strategy. *Archnet-IJAR*, 13(2), 349–367. <https://doi.org/10.1108/ARCH-11-2018-0002>

Hoang, A., Apparicio, P., & Pham, T.-T.-H. (2019). The Provision and Accessibility to Parks in Ho Chi Minh City: Disparities along the Urban Core—Periphery Axis. *Urban Science*, 3(1), 37. <https://doi.org/10.3390/urbansci3010037>

IEP. (2019). *SDG16+ Progress Report 2019*.

<http://visionofhumanity.org/app/uploads/2019/03/SDG16Progress-Report-2019-web.pdf>

Jiao, X., Jin, Y., Gunawan, O., & James, P. (2015). Modelling Spatial Distribution of Outdoor Recreation Trips of Urban Residents. *International Review for Spatial Planning and Sustainable Development*, 3(3), 36–49. [https://doi.org/10.14246/irspsd.3.3\\_36](https://doi.org/10.14246/irspsd.3.3_36)

Khaza, M. K. B., Rahman, M. M., Harun, F., & Roy, T. K. (2020). Accessibility and Service Quality of Public Parks in Khulna City. *Journal of Urban Planning and Development*, 146(3), 1–14. [https://doi.org/10.1061/\(ASCE\)UP.1943-5444.0000589](https://doi.org/10.1061/(ASCE)UP.1943-5444.0000589)

Kimpton, A. (2017). A spatial analytic approach for classifying greenspace and comparing greenspace social equity. *Applied Geography*, 82, 129–142. <https://doi.org/10.1016/j.apgeog.2017.03.016>

Kothencz, G., Albrecht, F., Hölbling, D., Pürmayr, K., & Osberger, A. (2018). Integrated analysis of urban green spaces and recreation areas: Transferability and applicability. *Acta Horticulturae*, 1215, 319–324. <https://doi.org/10.17660/ActaHortic.2018.1215.59>

Kubota, A., Matsushita, M., Smith, B. J., Sugiyama, T., & Arao, T. (2019). The impact of a new exercise facility on physical activity at the community level: A non-randomized panel study in Japan. *BMC Public Health*, 19(1), 1–8. <https://doi.org/10.1186/s12889-019-7146-x>

Lahoti, S., Kefi, M., Lahoti, A., & Saito, O. (2019). Mapping Methodology of Public Urban Green Spaces Using GIS: An Example of Nagpur City, India. *Sustainability*, 11(7), 2166. <https://doi.org/10.3390/su11072166>

Larson, L. R., Jennings, V., & Cloutier, S. A. (2016). Public parks and wellbeing in urban areas of the United States. *PLoS ONE*, 11(4), 1–19. <https://doi.org/10.1371/journal.pone.0153211>

Lee, K. Y., Macfarlane, D., & Cerin, E. (2013). Objective Evaluation of Recreational Facilities: Development and Reliability of the Recreational Facility Audit Tool. *Journal of Park & Recreation Administration*,

- 31(4), 92–109. <http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=94949243&site=ehost-live>
- Leon-Moreta, A., Totaro, V. R., & Dixon, D. S. (2020). Social heterogeneity, local capacity, and urban parks: Evidence from US cities. *Cities*, 99(December 2018), 102588. <https://doi.org/10.1016/j.cities.2019.102588>
- Liu, T., Rosenberg, C., & Rowley, H. A. (2007). Clustering billions of images with large scale nearest neighbor search. *Proceedings - IEEE Workshop on Applications of Computer Vision, WACV 2007*. <https://doi.org/10.1109/WACV.2007.18>
- Lo, A. Y. H., & Jim, C. Y. (2012). Citizen attitude and expectation towards greenspace provision in compact urban milieus. *Land Use Policy*, 29(3), 577–586. <https://doi.org/10.1016/j.landusepol.2011.09.011>
- Maia, A. T. A., Calcagni, F., Connolly, J. J. T., Anguelovski, I., & Langemeyer, J. (2020). Hidden drivers of social injustice: uncovering unequal cultural ecosystem services behind green gentrification. *Environmental Science and Policy*, 112(May), 254–263. <https://doi.org/10.1016/j.envsci.2020.05.021>
- Mavoa, S., Bagheri, N., Koohsari, M. J., Kaczynski, A. T., Lamb, K. E., Oka, K., O'sullivan, D., & Witten, K. (2019). How do neighbourhood definitions influence the associations between built environment and physical activity? *International Journal of Environmental Research and Public Health*, 16(9). <https://doi.org/10.3390/ijerph16091501>
- Metin, T. C., Katirci, H., Yüce, A., Saricam, S., & Cabuk, A. (2017). An inventory study on the categorization and types of recreational activities. *International Journal of Social Science*, 59(October), 547–561.
- Mowen, A. J., Barrett, A., Pitas, N., Graefe, A. R., Taff, B. D., & Godbey, G. (2018). Americans' Use and Perceptions of Local Park and Recreation Services: Results from an Updated Study. *Journal of Park and Recreation Administration*, 36(4), 128–148. <https://doi.org/10.18666/jpra-2018-v36-i4-8861>
- Mullenbach, L. E., Baker, B. L., Benfield, J., Hickerson, B., & Mowen, A. J. (2019). Assessing the relationship between community engagement and perceived ownership of an urban park in Philadelphia. *Journal of Leisure Research*, 50(3), 201–219. <https://doi.org/10.1080/00222216.2019.1581719>
- Nath, T. K., Zhe Han, S. S., & Lechner, A. M. (2018). Urban green space and well-being in Kuala Lumpur, Malaysia. *Urban Forestry and Urban Greening*, 36(October), 34–41. <https://doi.org/10.1016/j.ufug.2018.09.013>
- Powers, S. L., Lee, K. J. J., Pitas, N. A., Graefe, A. R., & Mowen, A. J. (2020). Understanding access and use of municipal parks and recreation through an intersectionality perspective. *Journal of Leisure Research*, 51(4), 377–396. <https://doi.org/10.1080/00222216.2019.1701965>
- Principles, K. (2016). *Recreation and Sport Policy*. 1–4.
- Rabe, S. E., Gantenbein, R., Richter, K. F., & Grêt-Regamey, A. (2018). Increasing the credibility of expert-based models with preference surveys – Mapping recreation in the riverine zone. *Ecosystem Services*, 31, 308–317. <https://doi.org/10.1016/j.ecoser.2017.12.011>
- Rigolon, A. (2017). Parks and young people: An environmental justice study of park proximity, acreage, and quality in Denver, Colorado. *Landscape and Urban Planning*, 165(May), 73–83. <https://doi.org/10.1016/j.landurbplan.2017.05.007>

- Rottle, N. D. (2016). Developing a Regional Open Space Strategy (ROSS) for Central Puget Sound, Washington State, USA. *Environmental Science and Policy*, 62, 133–138. <https://doi.org/10.1016/j.envsci.2016.02.016>
- Rusanov, A. V. (2019). Dacha dwellers and gardeners: garden plots and second homes in Europe and Russia. *Population and Economics*, 3(1), 107–124. <https://doi.org/10.3897/popecon.3.e34783>
- Song, X. P., Richards, D. R., He, P., & Tan, P. Y. (2020). Does geo-located social media reflect the visit frequency of urban parks? A city-wide analysis using the count and content of photographs. *Landscape and Urban Planning*, 203(November 2019), 103908. <https://doi.org/10.1016/j.landurbplan.2020.103908>
- Terzi, F., Tu̇rkoḡlu, H. D., Bȯlen, F., Baran, P. K., & Salihoḡlu, T. (2015). *Residents' Perception of Cultural Activities as Quality of Life in Istanbul*. 211–234. <https://doi.org/10.1007/s11205-014-0688-5>
- Tu, X., Huang, G., & Wu, J. (2018). Contrary to common observations in the west, urban park access is only weakly related to neighborhood socioeconomic conditions in Beijing, China. *Sustainability (Switzerland)*, 10(4), 1–12. <https://doi.org/10.3390/su10041115>
- Turner, L., Calvert, H. G., & Chaloupka, F. J. (2018). Barriers to Shared Use of Indoor and Outdoor Facilities at US Elementary Schools. *Journal of School Health*, 88(5), 379–387. <https://doi.org/10.1111/josh.12621>
- White, M. P., Elliott, L. R., Wheeler, B. W., & Fleming, L. E. (2018). Neighbourhood greenspace is related to physical activity in England, but only for dog owners. *Landscape and Urban Planning*, 174(May 2017), 18–23. <https://doi.org/10.1016/j.landurbplan.2018.01.004>
- Xing, L., Liu, Y., Liu, X., Wei, X., & Mao, Y. (2018). Spatio-temporal disparity between demand and supply of park green space service in urban area of Wuhan from 2000 to 2014. *Habitat International*, 71(October 2017), 49–59. <https://doi.org/10.1016/j.habitatint.2017.11.002>
- Yli-Pelkonen, V. (2013). Importance of recreational ecosystem services in Helsinki, Finland. *Management of Environmental Quality: An International Journal*, 24(3), 365–382. <https://doi.org/10.1108/14777831311322668>
- Yu, B., Che, S., Xie, C., & Tian, S. (2018). Understanding Shanghai residents' perception of leisure impact and experience satisfaction of urban community parks: An integrated and IPA method. *Sustainability (Switzerland)*, 10(4). <https://doi.org/10.3390/su10041067>.