A GIS Based Measurement of Accessibility of Urban Parks in Faisalabad City, Pakistan

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ABSTRACT

Urban parks are crucial part of whole urban environment. A starting point for inquiries about park utilization and the potential benefits of urban green spaces must begin with an assessment of their geographical accessibility. This comparative study focuses on spatial accessibility of existing neighborhood parks in Faisalabad city. The knowledge has been driven through systematic random sampling of visitors within the parks. Systematic random sampling method was used to collect the qualitative as well as quantitative data. Data were analyzed by applying statistical techniques like tabulation, chi square, and correlation for the comparison. Findings suggest a strong association between parks and spatial accessibility of park visitors. Results shows that the majority of park visitors in Gatwala Park come from the distance of 2-3 km and in Jinnah park 5-7 km distance is traveled by the most of the visitors.

Keywords: Accessibility, Neighborhood, Urban Parks, Buffer analysis

INTRODUCTION

Today, urban parks are one of the most important spaces in the urban areas. Measuring accessibility to urban parks is a commanding tool to analyze individual mobility patterns of visitors. Parks plays a multi-purpose role in urban areas that provides social, economic and environmental benefits (Saleem, A 2013).

Public open spaces (POS) were established in the United Kingdom and the United States in 19th century with the aim of improving the health and worth life of the working classes who live in wretched living conditions. It seems that the distance from home to the parks also has impact on the frequency of use and type of use of parks and when it was designing for the first time; people have a strong belief in the possible outcomes related to health that may result from the open space. They articulated the hope that the parks would reduce disease, crime, and social conflict, as well as providing "green lungs "of the urban place and areas for amusement (Giles-Corti et al., 2005).

The major focus of the analysis is to study parks / green spaces in urban areas, including through the measure of parks accessibility and the relative area and the number of parks in communities (Potestio et al., 2009). Measuring accessibility to urban parks is the potential tool to examine individual mobility patterns (Reyes et al., 2012).Parks are key component of urban environment. The main focus on parks in this study is for the main reason that parks source of maintenance not only for the natural ecosystem but also preserving the biodiversity in the whole world. Because of this, easy accessibility of parks play considerable role in physical health for the majority of the people in city areas. (Nicholls, 2001).Whereas the accessibility is concerned, accessibility is relative closeness or proximity of one location to another (Reyes et al., 2012). Parks / Green spaces are definitely the best way to engage people in healthy exercise. The size of urban parks, the spatial distribution and endowments are a sign of the basic indicators used to measure the sustainability of city environments and

quality of life in residential space (Ioja, et al, 2010). Access refers to the individuals and the distance that the individual must travel to get from his home to the nearest park. This is likely to be a strong indicator of physical activity in public parks, and those who live closer to the park may be more likely to visit and thus be physically active in it (Ariane et al., 2005). Faisalabad city is taken as the study area in this research which, spatially, do not have well distribution pattern of urban parks. Existing parks in study area usually range in size between 50 to 132 acres which fulfills the definition of neighborhood parks.

The main focus of this research is on the measurement of spatial accessibility of urban parks. Actual accessibility of visitors to urban parks was assessing on the basis of buffering analysis. Analysis has been performed on the basis of walk time and distance. This study also explicates the comparison between the results calculated on the basis of actual accessibility and proximity analysis. The study focuses to measure the accessibility of people in selected Parks (Gatwala Park and Jinnah Park) of Faisalabad. The objective of the study includes the measurement of spatial accessibility of people towards urban parks. For the purpose travel time of travel to reach park and distance of the respondent from destination to park were observed.

MATERIALS AND METHODS

Faisalabad is a district of Punjab Province, Pakistan. It is located at longitude 73°74 East, latitude 30°31.5 North, with an elevation of 184 meters (604 ft) above sea level. The study was conducted in two selected parks for the only reasons that, these two parks have expected the more visitors. Jinnah Park is located in almost in the center of the city and Gatwala Park is located in the outer fringes of the city. The study is based on primary and secondary data sources. Primary data were collected through field survey. Secondary data was collected from various sources such as libraries, digital library, online articles, journals and books. Secondary data was also collected from various departments like PHA (Parks and Horticulture Authority), FDA (Faisalabad Development Authority), Forest department of Faisalabad and City District Government of Faisalabad. Similarly some secondary data was collected from statistical Reports, District Census Report of the Faisalabad city. The questionnaire was design to meet research objective and to answer the research questions. Sample was selected from targeted population from the parks visitors. Cartographic techniques were used to present data statistically on the map. Buffering analysis has been applied for checking the accessibility. Buffers were taken at 1 KM distance.
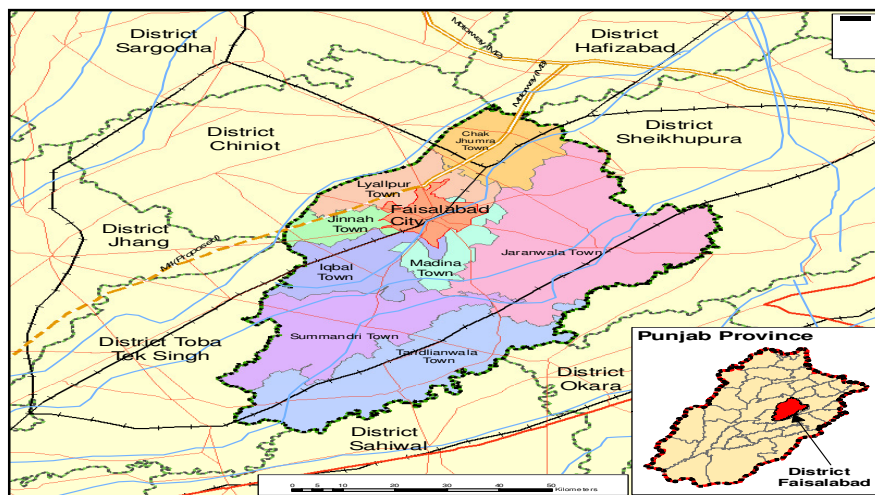

Figure 1. Location map of Faisalabad city

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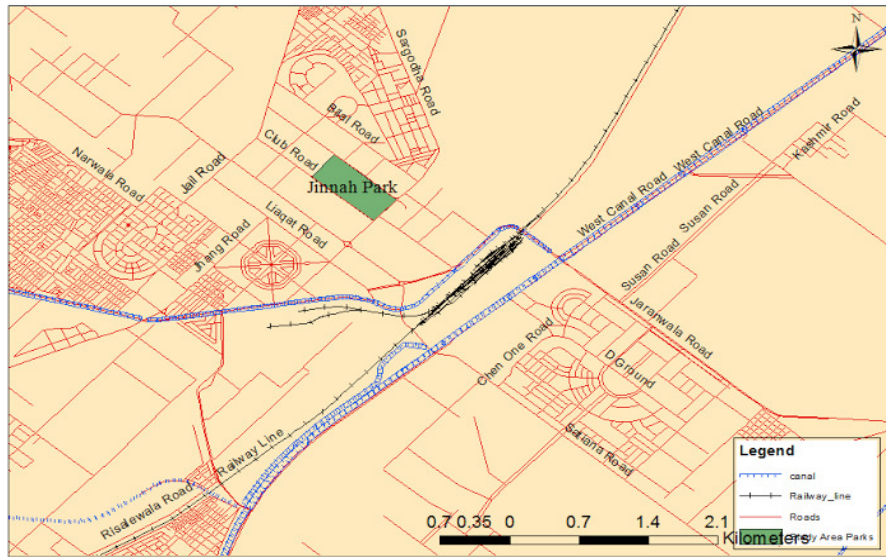**www.journals.savap.org.pk**
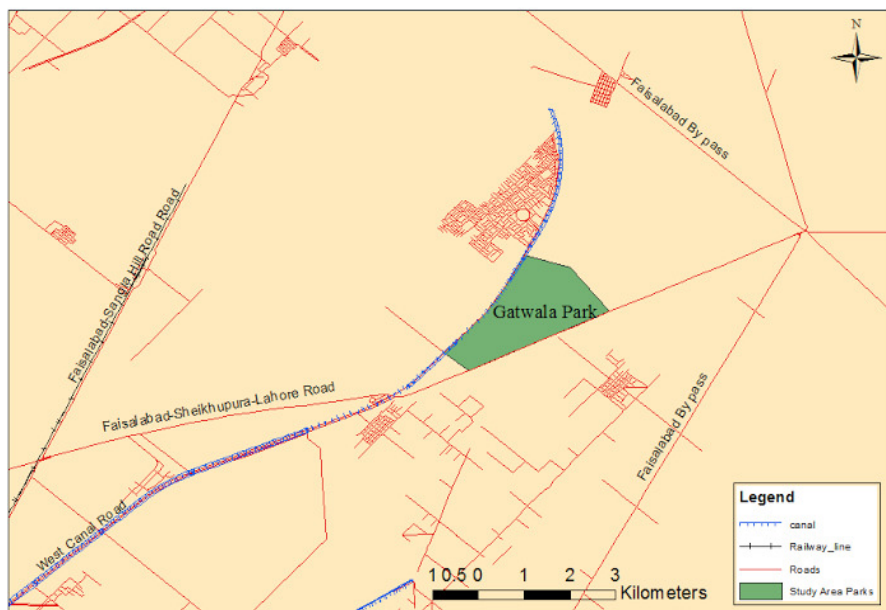
Figure 2. Location of Jinnah Park

Figure 3. Location of Gatwala Park

RESULTS AND DISCUSSIONS

For the study purpose the following parameters were investigated to check the accessibility of urban parks in Faisalabad:

1. Time
2. Distance

In Table 1 chi square value (195.62) shows a highly significant association between distance and parks. As shown in the above table that distance has affected the visitors. More people are attracted to parks due to short distance from their destination and parks area. Nearly 20 percent visitors visit the Jinnah Park at the distance of 2-4 km while only 9 percent visitors visit the Gatwala Park at the same distance.

Table 1. Respondents According To Their Distance from Destination to Parks

Distance	Park Name		Total	Distance	Parks Name		Total
	Gatwala Park	*Jinnah Park*			*Gatwala Park*	*Jinnah Park*	
Less than 1 km	0	27	27	*11-13 km*	78	8	86
	.0%	5.4%	5.4%		15.6%	1.6%	17.2%
2-4 km	47	104	151	*14-16 km*	28	0	28
	9.4%	20.8%	30.2%		5.6%	.0%	5.6%
5-7 km	32	94	126	*17-19 km*	14	1	15
	6.4%	18.8%	25.2%		2.8%	.2%	3.0%
8- 10 km	43	16	59	*20-22 km*	8	0	8
	8.6%	3.2%	11.8%		1.6%	.0%	1.6%
				Total	250	250	500
					50.0%	50.0%	100.0%

Chi square = 195.62; d.f= 7; P= .000

The less people gravitate toward the Gatwala Park with the increase in the distance while due to suitable location of Jinnah Park, more visitors visits the Park at daily basis for walk. Mostly visitors visit the Gatwala Park at different occasion e.g. for picnic purposes, for study tour and enjoy and entertainment.

Table 2. Numbers of visitors according To Their time taken to reach the Parks

Time	Parks Name		Total	Time	Parks Name		Total
	Gatwala Park	*Jinnah Park*			*Gatwala Park*	*Jinnah Park*	
Less than 5 Minutes	26	26	52	*22-26 Minutes*	3	0	3
	5.2%	5.2%	10.4%		.6%	.0%	.6%
5-10 Minutes	85	107	192	*27-31 Minutes*	9	0	9
	17.0%	21.4%	38.4%		1.8%	.0%	1.8%
11-16 Minutes	97	102	199	*Above 31 Minutes*	2	0	2
	19.4%	20.4%	39.8%		.4%	.0%	.4%
17-21 Minutes	28	15	43	*Total*	250	250	500
	5.6%	3.0%	8.6%		50.0%	50.0%	100.0%

Chi square = 20.57; d.f= 6; P= .001

Chi square value (20.57) shows an association between time and respondent accessibility towards parks. It was found that almost majority of visitors who access the Jinnah Park taken the time less than 20 minutes while Gatwala Park experienced the visitors whose come from more than 30 minutes.
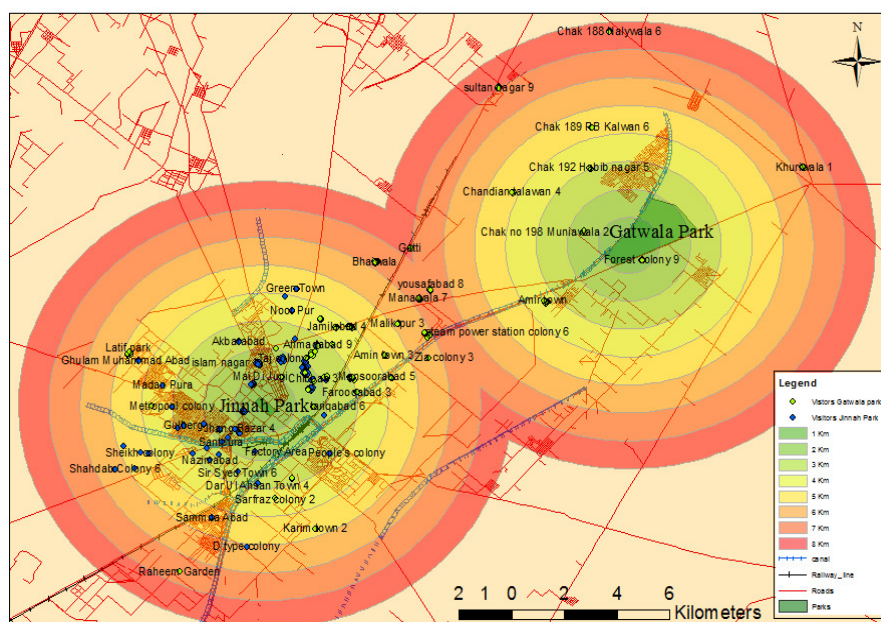
Figure 3. Comparisons of Served Areas by Parks

In figure 3 concentric buffers demonstrate the association between distance (km) and spatial accessibility of visitors towards Jinnah Park and Gatwala Park. Buffers were taken at the distance of 1 KM. The comparison of these two Parks indicates that Jinnah Park serve its neighborhood areas while Gatwala Park has less services for its neighborhood areas. Buffer analysis also shows that most of the visitors of Gatwala parks are from center of the city. Most of the visitors visit the parks for different activates e.g. walk, play sports and games, picnic, family outing, for entertainment and meeting friends. The simple buffers indicate that majority of visitors came to the park at the distance more than 8 KM for the only reason that this Park is located in suburban areas of Faisalabad city and it provide large space for visitors. Buffers also indicate that most of the people of suburban do not visit the Gatwala Park because they have their own agriculture land. Most of the visitors visit this park at weekends or at events e.g. study tour, picnic, Family outing and play sports and games from the central areas of Faisalabad city. The simple buffers shows that majority of visitors came to the Jinnah park at the distance of 1-5 km which means that this study area serves the majority of visitors who access from neighborhood for walk or exercise on daily basis. The maximum visitors flow according to buffer analysis is from Ptcl Colony, Gulistan colony, Chibban, Taj colony, Civil Lines and Sharefpura which lies at a distance of 2-6 Km. while less flow has been observed in areas e.g. Raheem Garden, Gatti, Samnabad and Ghulam Muhammad Abad that are located at a distance of 6-8 KM. Overall results show that although Gatwala Park takes the large area but less serve the majority of people who live in Faisalabad city due to transportation problem or its neighborhood agriculture land but Jinnah park on the other hand, serve the large population.

CONCLUSION AND RECOMMENDATION

The following conclusion can be drawn after the results and discussion of the research. 500 participant (250 each park) filled out the survey questionnaire. The equal distribution of participants for this survey is concerned, because it means that some related findings cannot be intermingled. Result shows that the Jinnah Park which is located nearly in city center area has more accessible for the visitors of Faisalabad. Whereas Gatwala Park has least accessible for people due to its location. Gatwala Park is located nearly outside from the city and also

bounded between many villages. The major difference can be finding in the form of accessibility. The data shows that 55.2% of people who live within two to seven kilometers of the park indicated that they had been more visiting the parks. Only 9.5% visitors who lived in 2-4 kilometers of the Gatwala Park had been visited this park. While 20% visitors visit the Jinnah Park who live in same distance. The only reason behind this difference is accessibility. Therefore, it is clear that accessibility influences the decision to go to the park.

Although visitors come to the park regardless of its poor condition, the research suggests that it is still necessary to upgrade the quality of urban parks. Park is the only free public green space in the city of Faisalabad; it is likely to be popular regardless of its condition. However, in its current state, it simply does not fulfill the needs and desires of visitors. For example, it has less number of proper support grounds, which does not meet the considerable demand of park visitor. Local Government should take steps to improve the condition of parks. The finding suggests that there is a critical need for better urban open spaces in Faisalabad. It highlights the need to upgrade Faisalabad Urban Parks. City District Government should provide public transport other than "Metro bus" to the people of Faisalabad. So that more people visits the parks and enjoy the open space. Local Government must set a regular timetable for parks maintenance to ensure that the park is always in good condition. Local Government should be built new facilities for recreation in other places in the city of Faisalabad.

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