Open Green Spaces - Asset or Liability-Case Study of North Nazimabad Town-Karachi

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Abstract: An extensive and intensive survey of Open Green Spaces of North Nazimabad Town and an in-depth study of Satellite – Google Imagery 2007 has been the basis of assessment of outdoor recreational facilities available in this area. North Nazimabad Town became a separate administrative unit of Karachi in 2002, to which Taimuria, Buffer Zone, Shadman and Paposh were attached. In this town there was an allotment made according to the Layout Plan 1953 for Open Spaces such as parks and playgrounds, which was an asset for the area; but unfortunately the population increased so rapidly that most of these recreational spaces were encroached upon by land mafia for sundry reasons, thus converting them into liabilities. This encroachment has not only reduced the open spaces of the parks and playgrounds but they have deteriorated and people refrain from visiting and using them because they have not been properly maintained and managed and have become an environmental hazard for the residents of this area and the city.

These Open Green Spaces not only help to improve the urban ecology, as they are lungs for the cities, being highly beneficial for human beings. Improper maintenance of these Open Green Spaces is not only a bane for society but ill maintained parks and playgrounds are also a breeding ground of environmental pollution, crimes and violence. This study highlights the complexities of the Open Green Spaces as assets or liabilities and this problem of urban ecology, concurrently pertaining to quality of urban living can be handled not only by increasing the number and area of parks and playgrounds but taking proper care of their maintenance, for which interdepartmental collaboration in the city is an essential pre-requisite.

Key Words: Karachi, North Nazimabad, Layout Plan, Parks and Playgrounds.

INTRODUCTION

Parks take their name from the verb 'to impark' which means to surround with a hedge, fence or wall. Parks and playgrounds are a necessity for the younger generation as places to play and for elders to relax in. Good landscape planning plays a vital role in saving the environment. According to Turner [1] a good environment like good health is easy to recognize but hard to define. Health is not valued till sickness comes. To conserve and improve our health, doctors must understand the working of the body. Similarly, in order to conserve and improve our environment, planners must understand the geographical equivalents of anatomy, physiology and biochemistry. Doctors find it easier to investigate surface anatomy than the interior. Planners find it easier to investigate the physical environment than its working. But one cannot treat the inside of the body by treating the skin, and one cannot improve the environment by dealing only with the visible. Knowledge, ideas, beliefs and skills are required to implement the diagnosis of problems.

Great civilizations allocate open space to public and non-productive uses. Historically, this has included gardens, temple compounds, ceremonial grounds, outdoor markets, social places, gymnasia for exercise and recreation, burial grounds, hunting and wildlife reserve. All this land is now classified by planners as "Open Green Spaces", because the land is accessible and unbuilt. In towns and in the country there must be landscapes where we can walk in safety, pick fruits, cycle, work, sleep, swim, listen to the birds, bask in the sun, run through the trees and laze besides cool waters [1].

Urbanization happens. Old settlements expand and new settlements are founded. It can be a consequence of increased wealth, population growth or preference for smaller households. People choose to live in proximity to urban areas for social and economic reasons, but they complain about environmental conditions: the city is a concrete jungle, it is ugly, it is unsafe, the air is polluted, there is insufficient contact with nature etc., and this becomes all the more magnified with blighted green spaces.

Parks play a vital role in improving the urban environment. They protect both urban life and nature simultaneously and the urbanite by virtue of being a tax payer is justified in his demand for open green breathing spaces, and has all the rights to a quality of life commensurate with his status as a law abiding citizen. Allotment of parks and playgrounds should therefore, not only be made to fulfill an official formality but in order to be of utilitarian value should also be well maintained, failing which they can have serious negative repercussions.

There are a number of studies in different disciplines pertaining to different regions and aspects related to parks

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0250-5363/07

and playgrounds. Open-air recreation and access to outdoor spaces is an important part of many people's daily lives, and research has shown that outdoor activity provides scope for relaxation, refreshment, escape from the everyday and chance to form social relationships [2]. Ulrich [3-7] uses a range of empirical evidence to argue that the benefits of viewing green-spaces goes beyond aesthetic enjoyment to include enhanced emotional well-being, reduced stress and in certain situations, improved health [6,8-12]. Attempts to measure the benefits of exposure to the natural environment have been widespread, e.g. when Bennet *et al*. [13] attempted to evaluate public access to a woodland site in monetary terms, they found that recreational benefits far out weigh the cost of access provision. The attributes that people valued most were 'peace and quiet', 'fresh air' and the 'landscape' [14,15]. In the development of urban forestry, parks are classified in terms of land-use as G&P (Gardens and Parks) in Chinese cities [16]. Parks are one of the major places of urban forestry. Trees are the most conspicuous and long living natural features of cities. They provide visible and tangible means, by which citizens interact with nature, and they provide habitat and food to sustain wildlife in the urban environment as is the case with Zoological Gardens. To facilitate such functions, landscape professionals employ trees to decorate the urban landscape, separate or define spaces, ameliorate settlements' microclimate, and abate air pollution [16-20]. Children's playgrounds provide an enjoyable environment in which motor and social skills can be developed [21].

Urban green spaces have important amenity values that include provision of leisure opportunities and aesthetics enjoyment. However, most of these values lack a market price. Consequently, they are usually ignored or underestimated by urban planning policy-makers, with the result that remnant urban green spaces are being gradually encroached upon by urban sprawl. As a result, quantitative information regarding the implicit, non-market price benefits from urban green space is urgently required [22].This study has been meant to contribute to knowledge in this regard.

STUDY AREA

The Study Area comprises areas covered by the Karachi Development Authority Scheme No. 2 of Taimuria , North Nazimabad, Lay Out Plan area of Nazimabad and North Karachi Township, parts of which combine together to form the present town of North Nazimabad.

North Nazimabad is a small densely populated town in the northern part of Karachi, named as such with reference to its being in the northern fring of Nazimabad. The town is bordered by New Karachi Town to the north across the Shahrah-e-Zahid Hussain, Gulberg Town to the east across the Gujar Nala stream, Liaquatabad Town to the south, and SITE Town to the west (Fig. **1**). The population of North Nazimabad Town was estimated to be about 500,000 at the 1998 census, of which 99% are Muslims. Several ethnic groups residing here include Urdu speaking, Punjabis, Sindhis, Kashmiris, Seraikis, Pakhtuns, Balochis, Memons, Bohras and Ismailis.

Scheme No. 2 of Taimuria which is also called North Nazimabad is located in the north eastern part of Karachi. This scheme of the KDA was prepared during the tenure of Karachi Improvement Trust and passed by the Government of Pakistan in 1953. This was planned as a beautiful and extensively well planned open area with very low density population. The width of the road ranged from 50 feet to 320 feet. This scheme was planned in 21 Blocks with all types of facilities in each Block. The size of the plots range between 200 to 3,000 Sq.Yds. in Taimuria Scheme. 11,874 residential areas, 473 commercial plots and 202 amenity plots of different types were planned [23]. The Town is now composed of 10 Union Councils (UCs), shown in Fig. (**1**).

METHODOLOGY

A detailed survey of Parks and Playgrounds of North Nazimabad Town and an in-depth study of Satellite Imagery-Google Imagery 2007 has been the basis of study of outdoor recreational facilities available in this area. Population data extracted from District Census Report 1998 and layout area of parks and playgrounds measured through Layout Map planned in 1953 while current area measured with the help of GIS forms the data base. An extensive survey for Ground Truthing of parks and playgrounds in the 10 UCs was conducted several times on different days of the week at varying daytime and evening hours.

With the help of Cartographic and Geographical Information System (GIS) techniques, Towns and UC boundaries have been demarcated. After completion of the Field Survey, a categorization of parks and playgrounds based on their maintenance level was made in order to make the study comprehensive.

Based on selected variables, levels of maintenance have been extracted from Z-Score Model. This Additive Model is an easy method for analysis of inequality and other related studies (Altman, 1968; Burke, *et al*. 2008, 2006; Huda, *et al*. 2007). The derivation of selected variables involves the transformation of data on individual variables into some kind of standard scores. This can be achieved in various ways including conversion into ranking and the standardization of the ranges, but the most common method is to use Z-Score.

The Z-Score is a linear transformation of the original data in such a way that its mean becomes '0' and its standard deviation becomes unity. For observation 'i' on any variable, the Standard Score (Z_i) is given by:

$$Z_i = \frac{X_i - \bar{X}}{S}$$

Where

X_i is the value for observation (i)

$$Xi = X - Xs$$

X is the value of variables, which have been formulated for the study

Xs is the specific standard for each variable in the study area (i.e. the highest value of the variable)

$\overline{X}$ is the mean of the specific standards

$$\overline{X} = \frac{\sum Xs}{n}$$

n is the number of observations

S is the Standard Deviation

$$S = \sqrt{\frac{Xs - \overline{Xs}}{n-1}}$$

This model has been applied in this project to measure ranking of parks.

Firstly, the data has been converted into percentages and units i.e. variables. Secondly, all selected variables have been arranged in descending order (*X*).

Thirdly, highest value of each variable has been selected as specific standard for each variable in the study area (*Xs*).

Fourthly, the specific standard for each variable has been subtracted from the value of variables formulated (*Xi*).

Fifthly, the mean and standard deviation of the set of specific standards for the set of variables has been calculated.

Finally, Standard Score (*Zj*) has been calculated for each variable.

To remove negativity of (*Zj*) the values have been squared.

The Standard Score Additive Model has been used to develop a Composite Score for ranking of parks. The 19 selected variables require the addition of the Z-Score for the

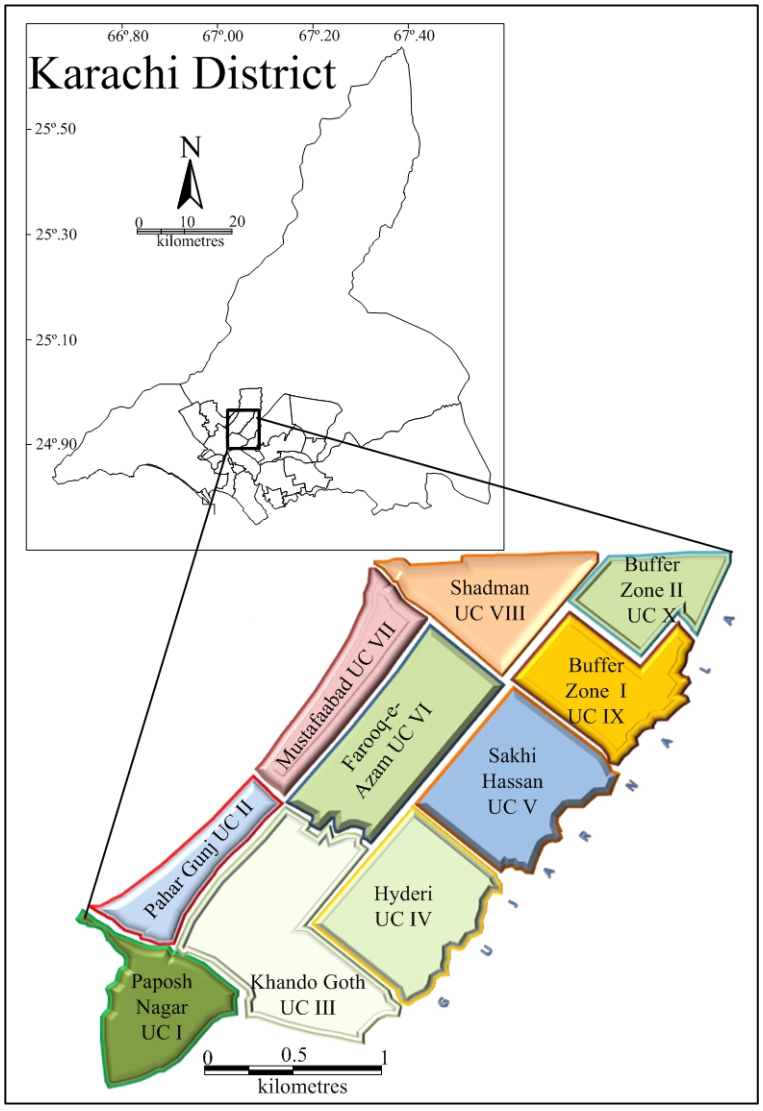

Fig. (1). Study Area - North Nazimabad Town.

individual variables taken to measure them. The model is thus:

$$I_j = \sum_{i=1}^{K} Zij$$

Where

I_j is the magnitude of the indicator for the park 'j'

Z_{ij} is the standard score on variables (i) in the park 'j'

'K' is the number of variables measuring the criterion in question.

Lowest Z- Score shows highest rank and vice versa in terms of selected variables on various parameters (Table **1**)

Population Data at Union Councils level extracted from District Census Report 1998, Karachi Central has formed the basis of comparative studies.

Table 1. Parameters

Greenery	Security Services
Boundary Wall	Parking Facilities
Gates	First Aid Centers
Street Frontage	Fire Fighting Facilities
Drinking Water	Lost and Found Facilities
Cleanliness	Washrooms
Seating Arrangement	Shades
Facilities for Children	Dustbins
Jogging Tracks	Fountains and Ponds
Facilities for Special Persons	

RESULTS AND DISCUSSION

According to the Layout Plan the total area of parks and playgrounds was 961,238.4 Sq. Yds. While the present area under this land use is 915,086.82 Sq. Yds. i.e. there has been a decrease of 46,151.54 Sq. Yds. although, parks and playgrounds have been constructed on land allotted for public buildings, primary schools and a hospital. According to the information by KDA based on the layout map, the total number of parks in North Nazimabad was 67 and playrounds only 04. However, Ground Truthing has revealed that there are only 56 parks left and 21 playgrounds. Now after various types of encroachments and alterations, 17 parks have been converted into playgrounds while 06 parks have been constructed on plots of land marked for public buildngs, 03 on land for primary schools and 01 each on a resieenial land and a plot for a hospital. The number of playrounds constructed on primary school plots are 03; number of parks converted into playgrounds are 13 and 01 playround has been constructed on land for 'Goth' (i.e. village).

It is important to note that although there is considerable encroachment of Open Green Spaces on land meant for other purposes yet its area has declined. It is most distressing to note that the shortfall of area from city's average of parks and playgrounds in North Nazimabad Town Layout Status that was made in 1953 has now dramatically reduced due to encroachment of all types.

A comparison of the Layout and Present Status of parks and playgrounds of North Nazimabad Town (Fig. **2**) shows that there is a great difference between what was planned and the existing condition. According to Layout Status, UCs Khando Goth, Farooq-e-Azam, Hyderi and Sakhi Hasan were planned with a view for maximum parks and playrounds but even then there was a short fall of these facilities. The UCs Shadman, Khando Goth and Hyderi have shown the maximum short fall in area of Open Green Spaces.

Fig. (**2**) also reveals that the area of parks and playrounds has increased in Mustafabad which has improved its rank from ninth to first, Sakhi Hasan fourth to second and Buffer Zone-I eighth to sixth. The greatest shortfall is in Shadman which has deteriorated form fifth to tenth rank, while that of Khando Goth has deteriorated from first to fifth, Farooq-e-Azam from second to third, Hyderi third to fourth and Buffer Zone –II from sixth to eighth. Paposh Nagar has shown no change in its rank between layout and present status but there has been a decrease in the total area.

Fig. (**3**) showing breakdown of total area of parks and playgrounds per 1000 population, both Layout and Present Status , reveals that deterioration in terms of coverage per

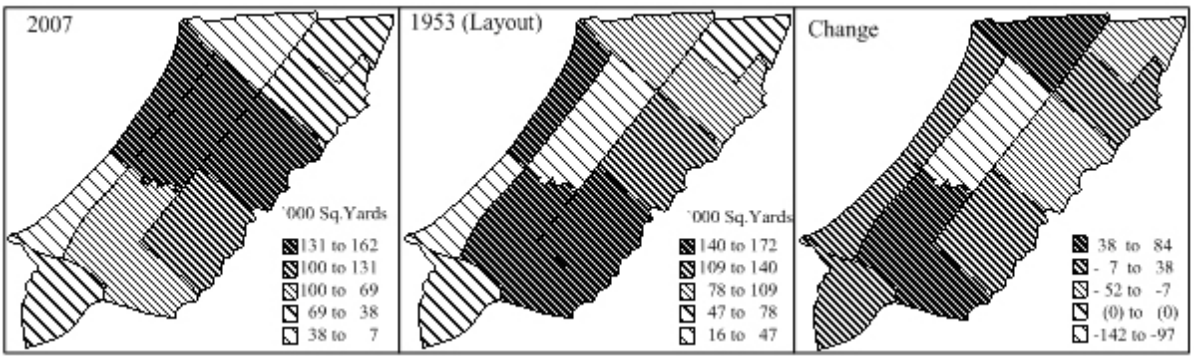

Fig. (2). Total area of parks and playgrounds.

1000 population has occurred in Shadman, Khando Goth, Hyderi and Buffer Zone II. Some improvement of acreage in relation to population pressure has occurred mostly in Mustafabad, Sakhi Hassan and Buffer Zone I. No change in this regard has been recorded for Pahar Gunj and Hyderi, although in the aggregate decrease has been recorded.

In terms of service provided to the UCs according to their size (Table **2**) the highest density of well maintained parks and playgrounds is in Farooq-e-Azam followed by Hyderi and Paposh Nagar. The greatest shortfall of this facility in terms of density of the service to the area is in Pahar Gunj followed by Buffer Zone I and Mustafabad.

Fig. (**4**) shows that in terms of well maintained parks and playgrounds, Hyderi is followed by Farooq-e-Azam and Paposh Nagar, while in terms of service provided to the population according to city standard i.e. 4 acres/1000 pop.

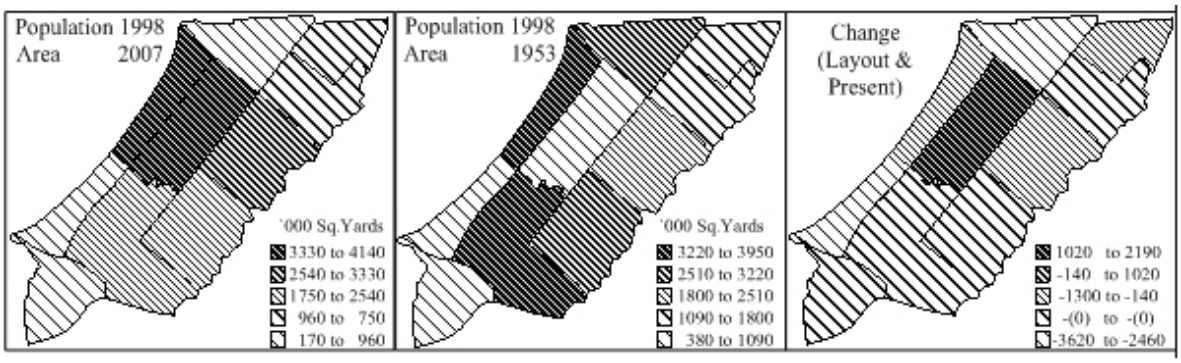

Fig. (3). Area of parks and plyground per thousand population.

Table 2. North Nazimabad Town - Well Maintained Parks and Playgrounds

No.	Name of UCs	Area of Well-Maintained Parks/ Playgrounds	Well-Maintained\ Parks/ Playgrounds\ per 1000 Pop.	Density of Well-Maintained Parks/ Playgrounds in %
1	Paposh Nagar	27008	389.69	1.51
2	Pahar Gunj	2420	57.24	0.19
3	Khando Goth	38886.8	738.42	1.07
4	Hyderi	50733	868.98	1.91
5	Sakhi Hassan	4363	73.55	0.16
6	Farooq-e-Azam	57146.4	1449.06	2.14
7	Mustafabad	0	0.00	0.00
8	Shadman	0	0.00	0.00
9	Buffer Zone II	10164	175.87	0.52
10	Buffer Zone I	6232	155.73	0.44

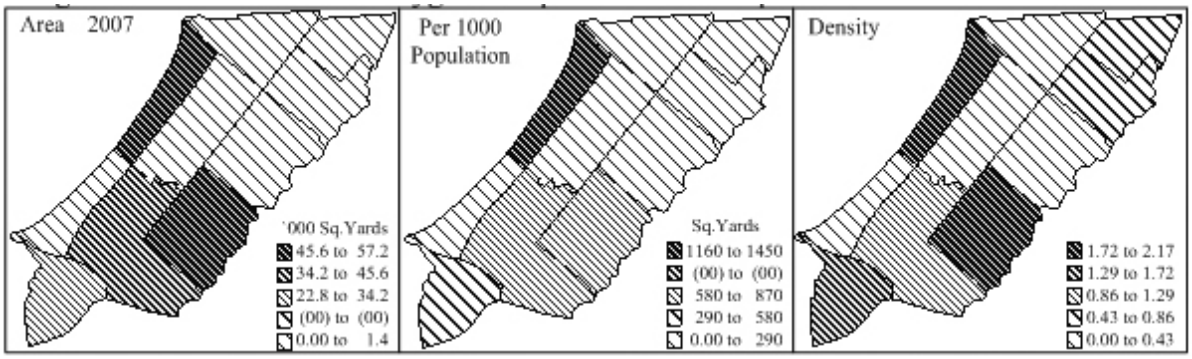

Fig. (4). Well maintained parks and playground.

(19,360 Sq.Ysds/1000 pop.) Farooq-e-Azam leads followed by Hyderi and Khando Goth; Mustafabad and Shadman have no well maintained parks and playgrounds.

The greatest shortfall of the facility to the population (Fig. **5**) is in UCs Mustafabad and Shadman followed by Pahar Ganj and Sakhi Hassan while Farooq-e-Azam is providing the best recreational and environmental facility in terms of parks and playgrounds, as the pressure of population on the Open Green Spaces is least as far as the Town is concerned. On realizing the necessity of parks and playgrounds the City District Government Karachi (CDGK) made additional allotments of land for more parks and playgrounds but with the passage of time these allotments did not materialize.

A comparison of data in Table **3** reveals the discrepancies. The density of population of North Nazimabad for 1998 was 27,643.12 persons per sq. km. (0.03 persons/sq. yd.). The highest density of population is found in Paposh Nagar, Pahar Gunj, Buffer Zones II and I while the lowest is found in Khando Goth, Farooq-e-Azam and Hyderi. A comparison of densities of population with that of parks and playgrounonds reveals that the best UCs as regards both factors taken comparatively are Mustafabad, Sakhi Hasan and Farooq-e-Azam. UCs showing worst comparative performance in this regard are Pahar Gunj, Shadman, Khando Goth and Paposh Nagar. Buffer Zone-I has fourth rank for both density of population and density percentage of parks and playgrounds. A comparison of density of parks and playgrounds between layout and present status shows that most remarkable improvement have taken place in UCs Mustafabad, Sakhi Hasan and Buffer Zone I which have improved their ranks from ninth to first, fourth to second and sixth to fourth respectively. On the whole, according to the Layout Status the Density of Parks and Playgrounds to area of UCs (in percentage) in North Nazimabad was 35.8% while that for the Present Status is 33.7% i.e. a decrease of 2.1%.

It is important to note that in the case of North Nazimabad Town although encroachment on land for parks and playgrounds has taken place, a number of parks and playgrounds have also been constructed on land allotted for Public Buildings, Primary Schools and Hospitals, yet there has been a decline in the total area under this use. Fig.(**6**)

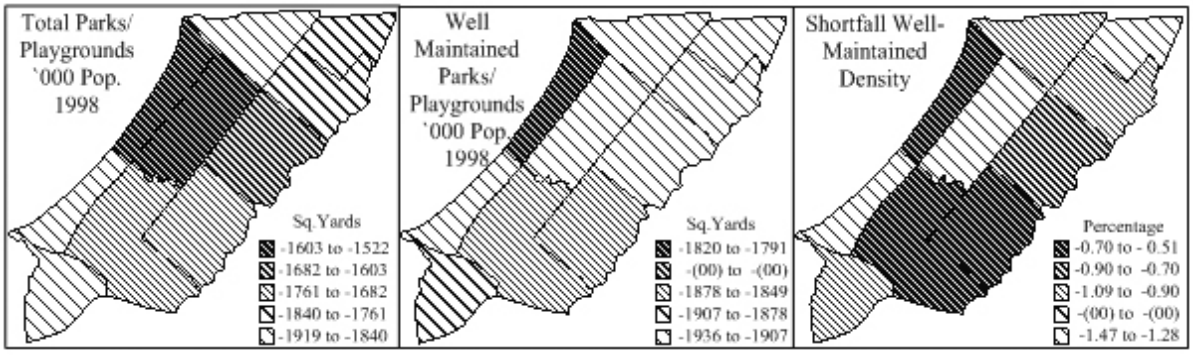

Fig. (5). Shortfall of parks and playgrounds.

Table 3. North Nazimabad Town - Density of Population and Parks and Playgrounds

No.	Name of UCs	Population 1998	Density of Population (Sq. Yards)	Density of Parks/ Playgrounds Present (%)	Density of Parks/ Playgrounds Layout (%)	Change in Density Present & Layout (%)
1	Paposh Nagar	69307	0.04	3.57	3.96	-0.39
2	Pahar Gunj	42279	0.03	0.56	1.25	-0.70
3	Khando Goth	52662	0.01	2.66	4.74	-2.08
4	Hyderi	58382	0.02	4.66	5.56	-0.89
5	Sakhi Hassan	59320	0.02	5.89	5.05	0.84
6	Farooq-e-Azam	39437	0.01	5.77	5.82	-0.06
7	Mustafabad	38998	0.03	10.74	1.35	9.39
8	Shadman	37996	0.02	1.18	5.59	-4.41
9	Buffer Zone II	57794	0.03	3.08	4.02	-0.95
10	Buffer Zone I	40019	0.03	4.87	4.24	0.63

reveals the steady deterioration in the area of the Parks and Playgrounds in North Nazimabad which has decreased from 4.48% to 4.26% and 3.96% between 1953, 2007 and 2008 respectively and at present the proportion of well kept Parks and Playgrounds is a negligible 0.09%.

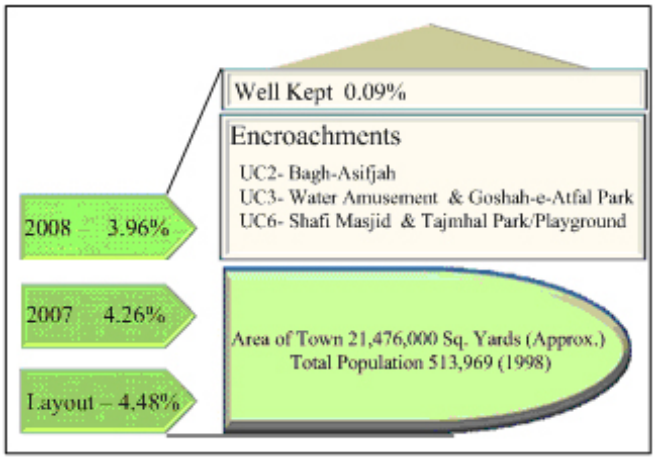

Fig. (6). Status of Parks and Playgrounds.

Fig. (**7**) shows the correlation between Crimes and Maintenance Levels of parks and playgrounds in North Nazimabad .The graph reveals that the Town falling under the jurisdiction of North Nazimabad, Noor Jehan and Taimuria police stations which have recorded the occurrence of various types of crimes for the year 2000, show hundred percent correlation with the area of ill maintained parks and playgrounds , providing cogent support to the hypothesis that negligence of Open Green Spaces provide excellent breeding grounds for all types of vices and crimes and are prime social liabilities which must be accorded exceptional attention for improvement, on a war footing, failing which the liability may lead to effervescence of serious moral liabilities and an incurable canker for the socio-cultural, political milieu.

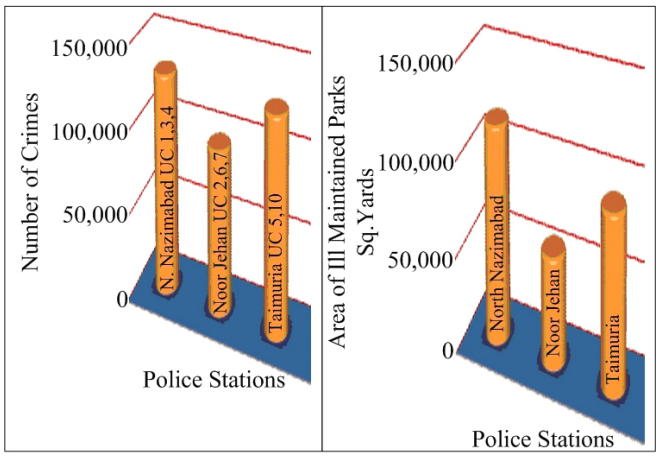

Fig. (7). Correlation between Crimes and Maintenance Levels of Parks and Playgrounds.

CONCLUSION

Even the most primitive tribes and cultures have felt the need for recreation. Now in the post-modern era with cities being converted into mega polis like Karachi, with its immense population pressure, excessive pressure on land use and resultant urban sprawl, the need and demand for Open Green Spaces is becoming all the more acute. Notwithstanding all these changes the jungle of concrete blighted by its slums and gobbling up of Open Green Spaces is not only a cause of social ills , anomalies and banes but it can became a cancer not only for the local area or people but for the nation as a whole and generations to come. While a well balanced urban land use with sufficient Open Green Spaces would not only justify the rights of citizens as tax payers but also prevent brewing up of socio-cultural and political conspiracies as empty minds are devils' workshops, while a physically, mentally, socially, culturally and economically vibrant youth can be the source of sustainable well being of a nation. The choice remains open whether we want to reap the multiple benefits of well maintained Open Green Spaces as assets with nominal maintenance costs or be entrapped in the vicious, multifanged dilemma with far reaching negative impacts.

ACKNOWLEDGEMENT

This research paper has been extracted from a project which was supported by the Dean Faculty of Science, University of Karachi, Pakistan.

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