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Potentials of creating pocket parks in high density residential neighborhoods: The case of Rod El Farag, Cairo city

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Abstract

Providing quality parks and recreational spaces for inner city residents especially in Metropolitan cities is considered a huge predicament. Cities are challenged to overcome escalated densities and limited amount of available land, through new opportunities and potential solutions in providing green spaces. Pocket parks arise as a solution to provide public spaces in such crowded environments. This paper reports the results of an empirical study performed in a residential informal neighborhood in Cairo city, the primary purpose is to evaluate the possibility of creating pocket parks with the community participation. Questioners and observations are conducted, the results indicate that transforming low traffic streets, and vacant land into pocket parks is possible and it is highly supported by the residents in the area. Despite the fact that the locals are willing to participate in enhancing their environment, still the major obstacles are transforming privately owned parcels and supplying sustainable fund.

Keywords: Pocket park , Cairo city, Quality of life , Open green spaces, High density seletments

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1. Introduction

Parks have long been recognized as major contributors to the physical and aesthetic quality of urban neighborhoods, they provide social, economic and environmental benefits to the community (Walker, 2004). However, providing quality parks and recreation space for inner city residents is increasingly challenged by the limited amount of available space. At present the global population has risen, cities are expanding and land value is rising. Expansion of residential and commercial uses in cities has resulted in the loss of green areas and created pressure against providing new open green spaces in the city.

In response to the preceding, a new type of open green space has been developed in high density areas of the city, where standard neighborhood park cannot readily be provided. This type suggests converting unused areas and abandoned spaces into what are being called pocket parks. Pocket parks, also known as mini park or vest-pocket parks, are urban open spaces at the very small scale. Usually only a few house lots in size or smaller (Ming, 2014). Cooper Marcus further defines a pocket park as one that serves up to a four block radius, with most of the users coming from within a one-two block radius (Smith, 2005).

The foundation of modern pocket parks has many historical roots. The major push towards pocket parks began in the 1960s in North America. A program developed in Philadelphia attempted to work with low income citizens in attempts to reclaim vacant and derelict lots for the purpose of leisure and recreation space. This initiative became a precursor to Philadelphia's investment in building pocket parks or mini-parks in neighborhoods throughout the city. Urban centers throughout North America began imitating these early examples of pocket parks (Smith, 2005; LeFlore, 2012). Since then pocket parks helped in developing a healthy urban environment and strengthening social fabrics; shaping community identity and enhancing their attractiveness to residents (Rabare and Onyango, 2009). Nowadays, different institutions and policy makers strive to increase the green area provision in cities through pocket parks. One promising attempt was London's major pursuit to create 100 'pocket parks' launched in 2009 (Greater London Authority, 2015), also the efforts of "The Park Association of New York City" which fosters creating pocket parks in New York City. Additionally, the city of Copenhagen in Denmark, planned to implement 14 additional pocket parks by 2015, as part of a larger vision to become the greenest capital city in the world (Triman, 2012). Therefore, a potential arises to implement such an approach in high density areas as Cairo city.

2. Informal high density residential areas in Cairo city

As known, most of the Egyptian cities, especially the cities in Great Cairo region, experience increasing signs of environmental, social, and economic stress. Phenomena related to the process of densification of the urban structure in the compact city. Population in Cairo is increasing vastly, as the city acts as a pole magnet attracting internal immigration seeking services and job opportunities. In 2014 the estimated population was 9.2 million people (State Information Service, 2014). Such demographic explosion generated problems such as traffic jams, pollution, noise, and crowdedness. The failure of the Egyptian housing policy to provide affordable, viable housing for a significant number of Cairenes, has led many to build homes, either semi-legally or illegally on privately-owned or public land (GTZ, 2009). Unfortunately, 70% of the Greater Cairo population live in so-

called informal areas (GTZ, 2009). Such settlements suffer from poor housing conditions; insufficient infrastructure and services (heaps of garbage, dried up planting, broken sidewalks); problems of accessibility, Lighting and ventilation problems; narrow streets; pollution; high densities; as well as shortage in recreational open green spaces (GTZ, 2009).

Despite of numerous attempts exerted by upgrading schemes in order to tackle the informal settlements challenges, it is constantly noticed that the act of creating and enhancing open green spaces is seldom included the development plans. The struggle over land vacancy and funding cripple the opportunity of providing parks or open spaces that need later on maintenance. Additionally, the absence of strategic green network plans for Cairo city deprive it from providing different topologies of well-connected green spaces to enhance accessibility and coherences. Summarizing the foregoing, it can be concluded that the role of green spaces in improving the living conditions in informal areas, raising the quality of life in poor and deteriorated districts is totally ignored. From this standpoint, the importance of recurring urban parks arises to remedy and mitigate the deteriorated quality of life in the city.

2.1. Provision of open spaces in Cairo city

Unfortunately, public parks in Cairo city suffer not only from scarcity, but also from poor quality and distorted distribution. For instance, the person quota from green spaces in the city doesn't exceed 1.2 m^2 / person. This average is considered very low, and it is expected to decrease even more due to scarcity in vacant land (Abd El Sallam, 2009). Moreover, green spaces are not well distributed, which creates accessibility hurdles and more challenges to connect the scattered green areas in a network. Other problems are poor designs, which are incompatible with users' needs; and incompetent management plans that fail to maintain parks to acceptable standards. From the former it can be seen that the provision of open spaces in Cairo city is far from meeting the minimum standards. Consequently, there is an urging need to increase the city provision of parks, in order to provide recreational opportunities and environmental benefits (reducing pollution and enhancing air temperature ect.).

3. Pocket parks as a refuge from the city bustle

The benefits of pocket parks go far beyond their communities, as they positively impact the well-being of the city and the region in which they are located. The fact that the park size is no more than ¼ of an acre doesn't impede it to offer a place for people to gather, relax, or to enjoy the outdoors (National Recreation and Park Association, 2012).

A research team from the University of Pennsylvania's Perelman School of Medicine has found that distressed neighborhoods where vacant lots have been converted into small parks and community green spaces are associated with reduced crime, more exercise, improved perceived safety, lower rates of health complaints and better mental health when compared to neighborhoods with unimproved vacant lots. Other multiple benefits of pocket parks are (National Recreation and Park Association, 2012):

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

4. Creating pocket parks

The ability of pocket parks to be placed throughout the urban fabric where they serve the immediate local population is their greatest advantage. However, their success requires careful planning, creative designs, and significant local support.

4.1. Planning pocket park in the city

The current park traditional topology consists of "neighborhood parks", "community parks", "city parks" and "nature preserves and linkages" (Abd El Sallam, 2009). Several researchers interested in studying the green spaces in the city suggest adding a new park system planning that would allow for mini-parks and plazas to be combined, especially in urban areas where there are no accessible local parks within a 400m radius, or 10-minute walking distance. Pocket parks would differ from the neighborhood park classification principally through their scale, as neighborhood parks customarily offer diverse recreational opportunities and have the infrastructure necessary to cater to a population whom will probably be arriving in cars. Oppositely, pocket parks would attract near users, arriving walking or biking (LeFlore, 2012).

Selecting the location and the distribution of pocket parks in the city is crucial to assure fulfilling social equality and targeting districts suffering the most from insufficient provision of green spaces. Predominately, the priority is to higher density residential areas with high numbers of families with children or the potential for such a demographic mix. Another criterion is the availability of potential parcels to be converted into pocket parks. Imagination has to be used in order to locate spaces for pocket parks as these may be found in nontraditional locations such as rooftops, building facades or foyers and vacant sites. The parks should serve a resident population of approximately 500-1000 persons within a 400m walking distance of all residences in their service area (10 minutes walking). Moreover, is should be accessible by both foot and bike, should not require the use of a car and open to the street on 2 to 4 sides (National Recreation and Park Association, 2012). The current settings of a parcel regarding its actual use, shape and ownership can encourage or deter the decision of nominating it to host a park.

Preferably, pocket parks should be located adjacent to greenways to ensure a good flow of park users. The parks preferably should be linked to other recreational, cultural and community facilities, and furthermore to the city pedestrian network (Transit Village Area Plan, 2007). A network of open spaces with a high degree of

connectivity will offer short traveling distances between parks, which will encourage residents to travel to and interact with each other. Eventually, this will promote social cohesion within the local community. Likewise, developing a network of urban open spaces will increase the ecological value of the city (Ming, 2014). For example, in the city of Copenhagen, the establishment of pocket parks went in hand with the creation of green streets and connections within the city strategy 2008. The vision strived to create a green livable city with quality and variety (Danish Architecture Centre, 2015).

4.2. Designing pocket parks

Does size matter? A main question arises when dealing with green spaces, skeptics argue that the pocket park small area from 0.7 acres to 3 acres (Council Policy, 1990) is not sufficient to play a role in enhancing the quality of life in urban areas. Contrarily, a conclusion has been drawn based on comparisons and other prior researches that the size of a park is not the major concern of park users, but rather its facilities and design (Ming, 2014). Another question arises, are all pocket park similar, or they are designed to fulfill different functions? Even though the existing literature treats pocket parks as a single type of park, they should be categorized into three different types: Active, Passive and Bonus (LeFlore, 2012). *Active parks* offer users the opportunity to participate in a particular activity. They may comprise a playground, small basketball court or other target activity that attracts interested people. *Passive parks* are not designed for a specific use, as they are a place for people to come and sit. They do not include playgrounds or exercise equipment, but may have a fountain or other focal point. *Bonus parks* occur at intersections or within a development of other uses, and were not initially planned as a park. A few benches or a ledge attracted people to sit somewhere, and over time, the space became a park. These spaces tend to be very small in size, sometimes less than a tenth of an acre, but often attract people who need a place to sit. Moreover, they may occur as a byproduct of private development, to fulfill legislative open space provision or to earn a special permit or even as a voluntary public contribution. This second type of bonus parks result in a public space on private property (LeFlore, 2012). Determining the park type is based on the area availability, surrounding recreational facilities and the community desires.

In order any of the preceding three types of pocket parks to achieve success, they should fulfill certain qualities. Parks should be accessible and visible; allow people to engage in activities without creating unpleasant interferes; are comfortable spaces (climatic) and have a good image; and finally, are sociable places where people meet each other (ONESTL, 2015; Project for Public Spaces, 2009; Shirley, 2013; Smith, 2005). Research indicates that it is imperative to engage the local community in the design process, both for designs and implementation stages (Lamontagne and Cavan, 2008; National Recreation and Park Association, 2012).

4.3. Implementing of pocket park designs

Mostly, over populated cities like Cairo city don't possess enough resources dedicated to establishing new parks. The first challenge occurs is acquiring the land needed to develop the parks. Leftover spaces and other urban eyesores owned by the city present opportunities for conversion to pocket parks. These are often purchased and owned by cities, with the agreement that they will be run and maintained by a foundation or other organization if the city is unable to maintain the park itself (National Recreation and Park Association,

2012). Another alternative for developing additional pocket parks could be privately-owned public spaces, spaces left over or created by public improvements or private development. Privately-owned public spaces are developed as part of larger development projects. Some buildings and uses require special licenses. These licenses can entail the developer to provide something in return for the exception from the local zoning code. These exceptions can be in the form of providing a pocket park within the development projects (LeFlore, 2012). Another encounter facing municipalities is providing sufficient funding for the park. Despite of the fact that funding pocket parks is a hurdle facing local governments, there are a variety of possible funding sources such as (Harnik, 2008):

- Public-private ventures
- Individual contributions (private fund/philanthropic support)
- Grants
- Money from businesses
- Corporate sponsorships
- Impose dedicated taxes

It's vital to plan for, start-up, equipment costs, and also long-term funding concerning maintenance and repairs in the future (LeFlore, 2012). Determining who is responsible for developing the pocket park and maintaining it is vital. Either the municipality takes full responsibility, or a community group/private landowner take over, by creating a committee with divided responsibilities in terms of planning for and working on the project (Jarzen, 2014). The different maintenance plans can be discussed and negotiated by the municipalities and interested parties. Depending totally on local municipalities in establishing and operating pocket parks is not the ultimate choice. Community groups can play a profound role, either by cooperating with local governments or taking full responsibility in creating and operating the park. In all cases, it is essential to encompass: the community interest and needs; support and commitment; and certainly their participation in the design and the maintenance process. The active investment facilitated by community groups fosters a sense of ownership, which, in turn, creates a strong incentive for them to protect and preserve their park. After securing the fund and the maintenance plan, work days should be scheduled, either multiple work days, where people who cannot make one day can volunteer on another or one big day, where excitement for both volunteer recruiting and for fundraising are concentrated. The last action is organizing an opening celebration event, to possibly garner some outside (media) attention, as well as to involve as many people as possible (Jarzen, 2014).

5. Case study: Rod El Farag district in Cairo city

5.1. Aim of the study

The study aims at examining the possibility of implementing the pocket park concept in the Egyptian context, as it is not included in the open green spaces typology in Egypt.

Table 1. Examples of creating pocket parks in the city (Sustainable Communities Resource Center, 2012; Town of Erie, 2010; Greater London Authority, 2015)

	Los Angeles Case Study	**Colorado case study**	**London case study**
Picture			
Location	8 parks in South Los Angeles and 1 in the San Fernando Valley	The Town of Erie, Colorado	100 parks in 26 London boroughs.
Area	4,000 to 8,000-square feet each, for a total of 1.2 acres of green space.	-	-
Local	- A public meeting was held, 9 locations were picked from 20 proposed sites - Input on desired park amenities (such as exercise equipment, playgrounds, and benches),	- Pocket Park Design Standards and the needs of the development (based on demographics of the new residents and community needs and interests). - Locals would manage park programming and use	40 community groups participated
Site	Foreclosed properties		Under used/ forgotten areas/ Streets/ Developments enhancement
Park		Sitting areas, lawn areas, picnic shelters and tables, play equipment, artwork, or other amenities	Sitting areas, greenery Basketball pitch, play equipment, table tennis, picnic tables and performance platforms, and a dog run.
Funding and Implementation	- Neighborhood Stabilization Program bought the land - Construction work by the Department of Recreation - Fund from Los Angeles Housing Department and the city's Department of Recreation	Developers of a subdivision will be responsible for the design and construction	Outer London Fund/ Regeneration Fund/ Transport for London's public realm improvement programs. Greater London Authority
Maintenance	Inexpensive to maintain. Use solar lighting and drought-tolerant landscaping.	HOA or Metro District	Engaging locals to physically participate in the creation and maintenance of pocket parks

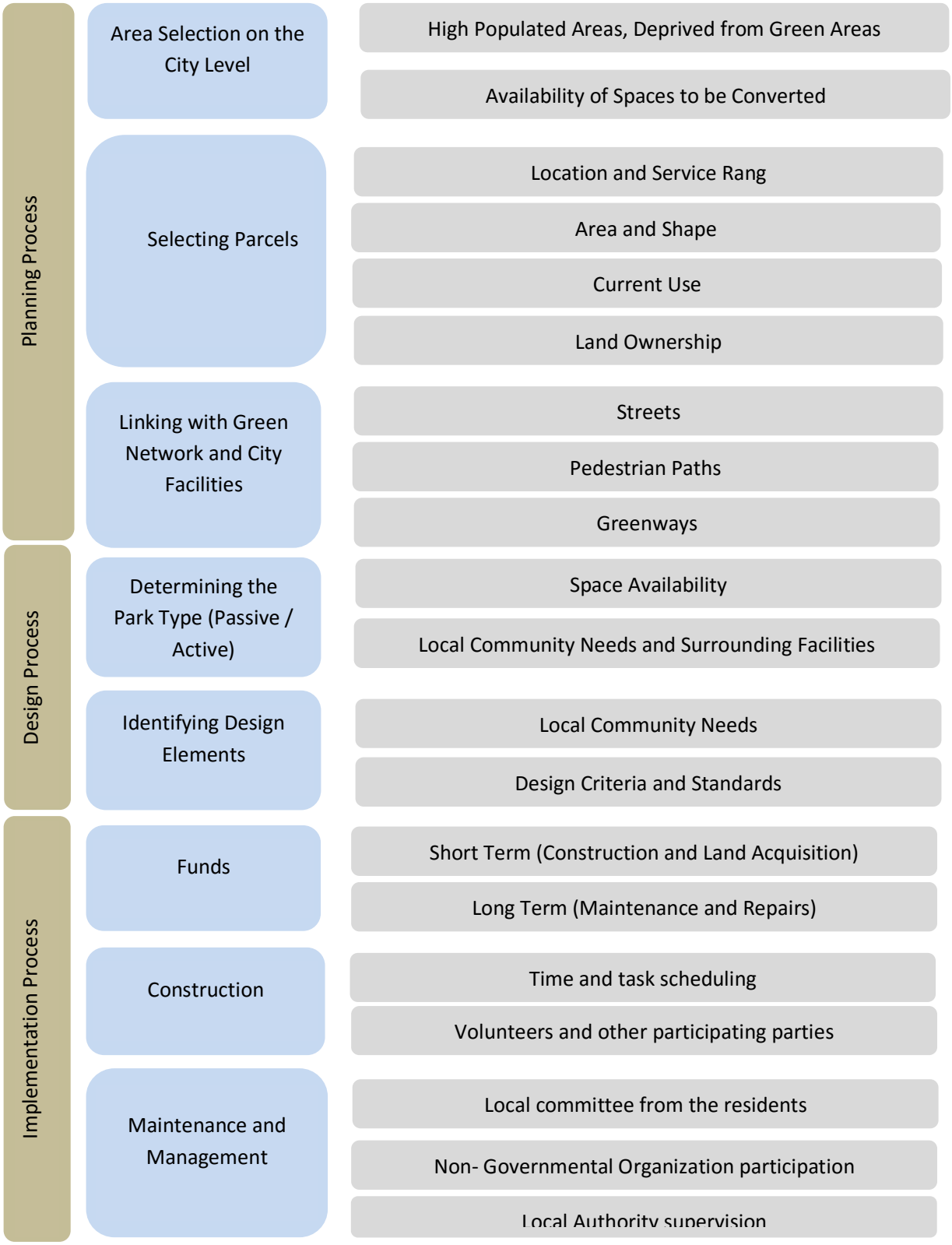

Figure 1. Creating pocket parks process

In order to achieve the study goal, the following parameters are investigated:

- The local community support for the idea
- Suitable locations for the pocket parks and their connection to the existing green network
- Proposed activities and facilities
- Funding/maintenance mechanisms and parties participating

5.2. Methodology

The study implemented different tools to gather data about the site, three tools are used, field survey, observation and a questionnaire. The field survey is conducted by the researcher in February 2015, to record the following data:

1- The physical environment of the spaces
2- Uses, amenities and facilitates.
3- Level of maintenance.

Observation is used to record activities within the spaces, including such things as playing, socializing or loitering. The activities, location, and its duration were recorded in February 2015. Several observational periods of 20-minute intervals occurred at various times throughout the day and night for 10 days. A closed ended questionnaire was conducted to residents in the study area. They were also subjected to a face-to-face semi interview, in order to apprehend their image about the current urban spaces, the value of pocket parks, suggestions to enhance the spaces and finally their willingness to participate in creating the parks. Gender and age are considered when choosing the interviewees to guarantee capturing all needs, a total of 25 residents were interviewed.

Table 2. The demographic characteristics of Rod El Farag dwellers (Central Agency for Public Mobilization and Statistics, 2006)

Demographics		**%**
Gender	Male	49.5
	Female	50.5
Age Group	Less Than10 Years	12. 1
	From 10-15	7.5
	From 16-45	43.4
	From 45-60	21.4
	More Than 60	15.6
Education	Illiterate	19.9
	Read and Write	29.7
	Intermediate	26.3
	High School	5.4
	College Graduate Or Higher	18.7
Employment	Unemployment rate	11.3
Occupation situation	Permanent job	76.5
	Occasional	12.9
	Day by day	10.6

5.3. Description of Rod El Farag district

Rod El Farag District, is one of the most populated and poor districts in Cairo city. Density reaches 74,000 inhabitants per square kilometer, the population number estimated in 2014 was 167,653 people; the total area is 2.264 km^2 (Cairo Governorate, 2015). The district used to be agricultural lands, by time buildings expanded, then it developed into an informal residential area. The district is supplied with main infrastructure (electricity/ water supply/ sewage system) but it is deprived of other services and facilities especially open green spaces. As for the resident demographics, it is found that, most families are extended (5-7 person/ family), some are single families (4 person/ family). Most of the residents are young, from 15-45 years old; the area suffers from a low education level and a high unemployment rate. Residents are low income citizens, mainly working as labor in factories, workshops, construction sites, drivers, and commercial activities, few work as government employees. Regarding women in the area, they mostly work in cleaning houses or are staying home mothers. Detailed characteristics are shown in Table 2.

6. The study area

The case study area is about 290,000 m2, it is the heart of the district, it hosts 21,400 inhabitants (with density 74,000/km2). The area stretches from Abo El Farag Street, which is to the east of the site. To the West is Abid Street, a government residential area (Masaken Naser) and a water treatment station. The main avenue is to the south called Gzeret Badran (Figure 3). The streets in the area are very narrow, straight, and extremely long. The pattern of the district follows the old pattern of the water canals of the former agricultural land. There are nearly no open spaces in the area; and ventilation and light are an issue. Most of the buildings are mixed use (ground floors used for daily services as mini markets, cafes, or workshops). The majority of the building conditions are poor, they are from 2-4 stories, except for new buildings which reach to 7 floors. Some services are found such as mosques, schools, nurseries, a police station, and a local health care center. The nearest open green spaces are Rod El Farag park and Rodet El Nile park adjacent to the Nile river.

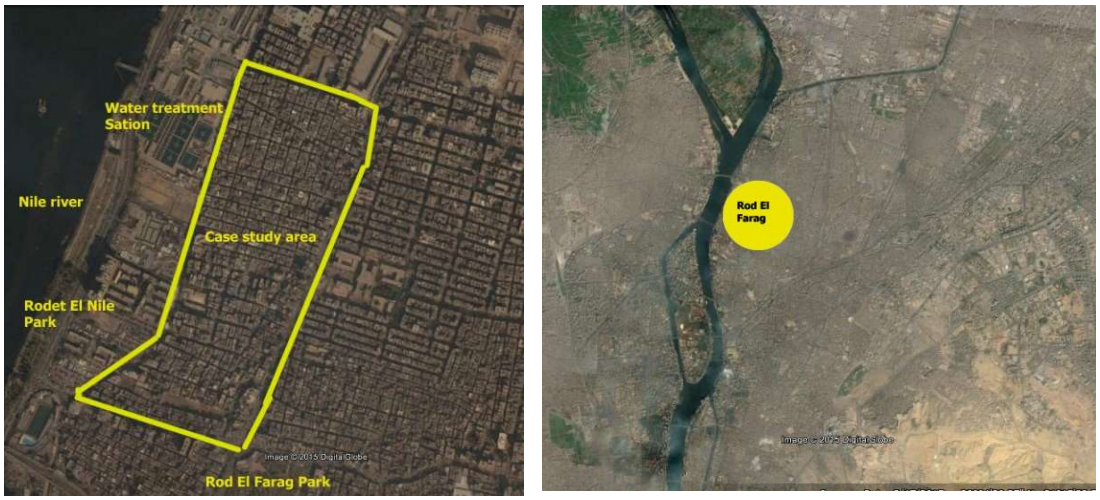

Figure 2. Rod El Farag (left) and the case study location (right) in Cairo

6.1. Spaces typology

There are several types of places which can be identified as potential spaces to be converted into pocket parks in the area, as the following:

- Vehicular streets (4-5 m wide)
- Closed end streets (3 m wide)
- Fenced vacant private land
- Walkways
- Vacant small parcels

6.2. Activities and vehicular traffic

Most of the activities observed are not organized in any fashion with the exception of football tournaments. The main streets and some inner spaces, mostly host the social interaction and stimulate local activities, while the rest of the inner spaces are passive and no activities occur in them (Figure 3). Inner street activities include:

- Meet and socialize
- Football matches
- Play Billiard
- Car, cart parking
- Storage area
- Workshop extension
- Domestic chores extension
- Raising pets
- Informal play (with marbles, hopscotch)

Main street activities include:

- Coffee shops
- Food vendors
- Wedding celebrations
- Funeral Memorials
- Riding bicycles
- Loitering
- Grocer shop extension
- Fruit and vegetable vendors (on carts)

It is noted that main street activities are more public and commercial, benefiting from exposure, access and spacious area.

Figure 3. Activities in main streets and inner spaces

The vehicular traffic penetrates the area, interfering with pedestrian paths, which creates traffic safety concerns, especially that children seems to be oblivious that a vehicle is approaching, as they do not respond to car warnings. Another great hazard is the trucks coming to the wheat mills company in the area. Those trucks obstruct the vehicular traffic totally and represent a threat to child safety.

6.3. Space characteristics

The hardscape materials are asphalt or interlocking pavers, no furniture as seats, shades, fountains, are found. The spaces lack planting in all its forms (trees, lawn ground covers, etc.), some spaces are lighted either by pole lights or by handing lights provided by the residents, but most of the spaces are totally dark in the evenings. Some other privately owned furniture is recorded as, billiard tables, kids play equipment (ferris wheel) which are rented to children on the site. Wreckage and debris items (private ownership) are stored next to the owner's building. Moreover, narrow spaces are used to park cars, carriages and carts, but this was recorded in few spaces, as most of the residents do not own private cars (Figure 4).

6.4. Users characteristics

The most engaged demographic in outdoor recreation and leisure activities on the site, are those in the under 12 years old age category, followed by teens and then adults. Teens and adults are present primarily during the evening, sitting in traditional coffee shops watching football matches and playing Backgammon.

Another notable observation is seen in the gender distribution, that there are more boy users than girls. Teenage girls usually stroll in the area, on the other hand, the male users generally play longer, more often and in larger groups than their female counterparts. Women socialize in 2-3 person group in the inner spaces, mostly while performing domestic duties. Most of the groups are typically formed within a similar age group, however, several times groups of young teens were observed playing with or alongside much younger children, especially after school time.

Figure 4. Open spaces and vacant land in the case study

7. Results

7.1. Local support for pocket parks

To investigate the dwellers' perception towards their environment, their desire to add pocket parks, and their willingness to participate in the improving process, a questionnaire and an interview were conducted. The results are:

1- Residents expressed their dissatisfaction regarding the current condition of the spaces in the area, as 88% believe that these spaces could be developed to serve efficiently the local community.

2- Residents (especially women with small children) argued that they would actually enjoy pocket parks slightly more than large urban parks due to accessibility, free entrance and freedom originated by less management. They admitted that developing current spaces would be very valuable since they could provide recreational and social refuge for the neighborhood. When asked about transforming streets to parks, the only concern was expressed by car owners, those how demanded having their cars parked near their homes to keep an eye on it, to prevent theft or vandalism.

3- Concerning the problems in the current spaces, interviewee stated that securing little children is the first priory, they explained safety hazards in the neighborhood, for example; traffic intersecting with pedestrian movement and construction remains piled in the main streets. Moreover, they stated that there are no facilities in these urban spaces (especially kid's playground). The small area, minimum sunlight, no planting and poor lighting were also mentioned.

4- Separating vehicular traffic from pedestrian areas, providing seats, playing area for kids, area to store and raise pets, trees, lights at night are the common recommendations (Figure 5).

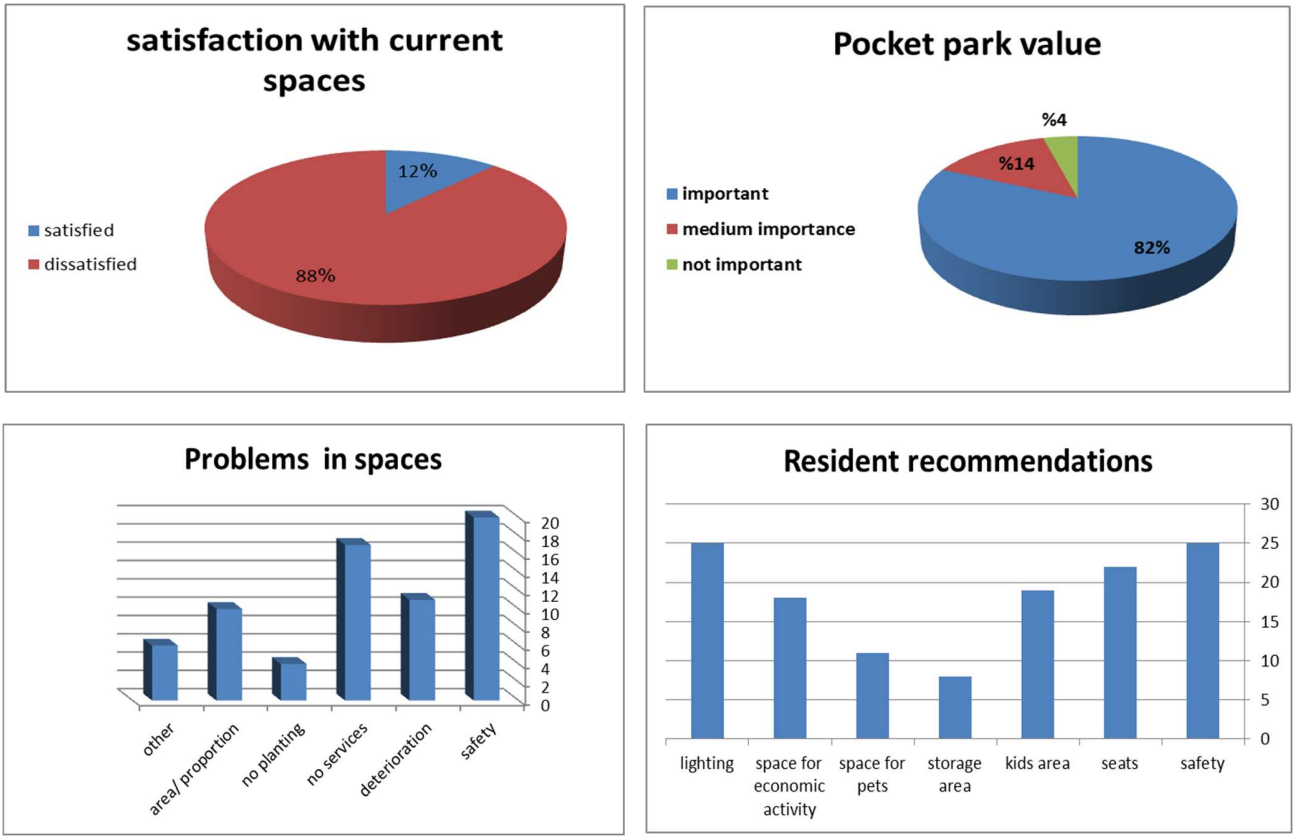

Figure 5. local residents' evaluations of the current spaces and their recommendations

7.2. Site selection

In high populated districts as Rod El Farag, it is hard to implement international standards regarding the number of residents served by a park. Therefore, a park in the area would serve 2000-2500 person. Based on the population size 21,400 person, 8-10 parks are needed to serve the case study area. Vacant plots are evaluated to select suitable spaces to be transformed into pocket parks. The priority was for parcels that: are easy to access, large in area, already host activity, public ownership and finally offer reasonable walking distances (Figure 6).

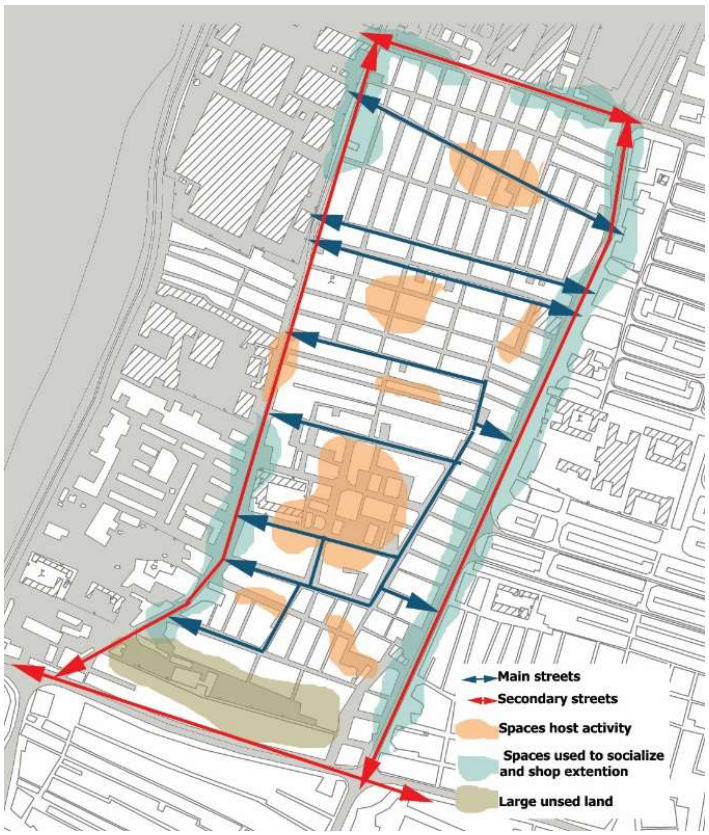

Figure 6. Analysis of the spaces in case study

7.3. Linking the proposed pocket parks

The case study suffers from an ambiguous circulation system; where pedestrian movement mingles with vehicle traffic, therefore a new circulation system is recommended. The proposed circulation strives to enhance transportation and safety, firstly through identifying vehicular streets. Traffic flow and street width are used to select the streets that would serve vehicles (less than 6 m right of way is considered inadequate). Consequently, some of the narrow streets were transformed to pedestrian paths and some served as parking lots. The pedestrian paths were designed to accommodate a lane for bikers and allow ambulance and police cars to serve the area in case of emergencies.

The proposed sites for the new pocket parks were linked to the surrounding residential area with paths and/or streets to emphasis accessibility. Walking distance ranged from 150 to200 m. Additionally, the park sites were connected with adjacent recreational and cultural activities such as Rod El Farag Park, youth center, and the Nile waterfront in order to achieve a coherent open green space network.

7.4. Pocket park types and activities

Three types of pocket parks were proposed: active parks, passive parks, and bonus parks as shown in Figure 7 and Table 3.

- One active parks hosting kid's area, planting, seating area and informal playing zone, vendors, renting billiard tables.
- Four passive parks, including, seating area and multi-function spaces to be used in celebrations.
- Three bonus parks to serve users in/outside the area, the parks are located near the main streets and host coffee shops, vendors, retailers.
- Pedestrian paths to be used for walking and biking.

Other additional recommendations

- Relocating the North Cairo Flour Mills Company and reusing the land to provide services and open green spaces needed in the neighborhood.

Private owned land (car repair shops/ vacant) to be used to provide serves needed in the neighborhood and open green spaces, after resolving acquisition problems.

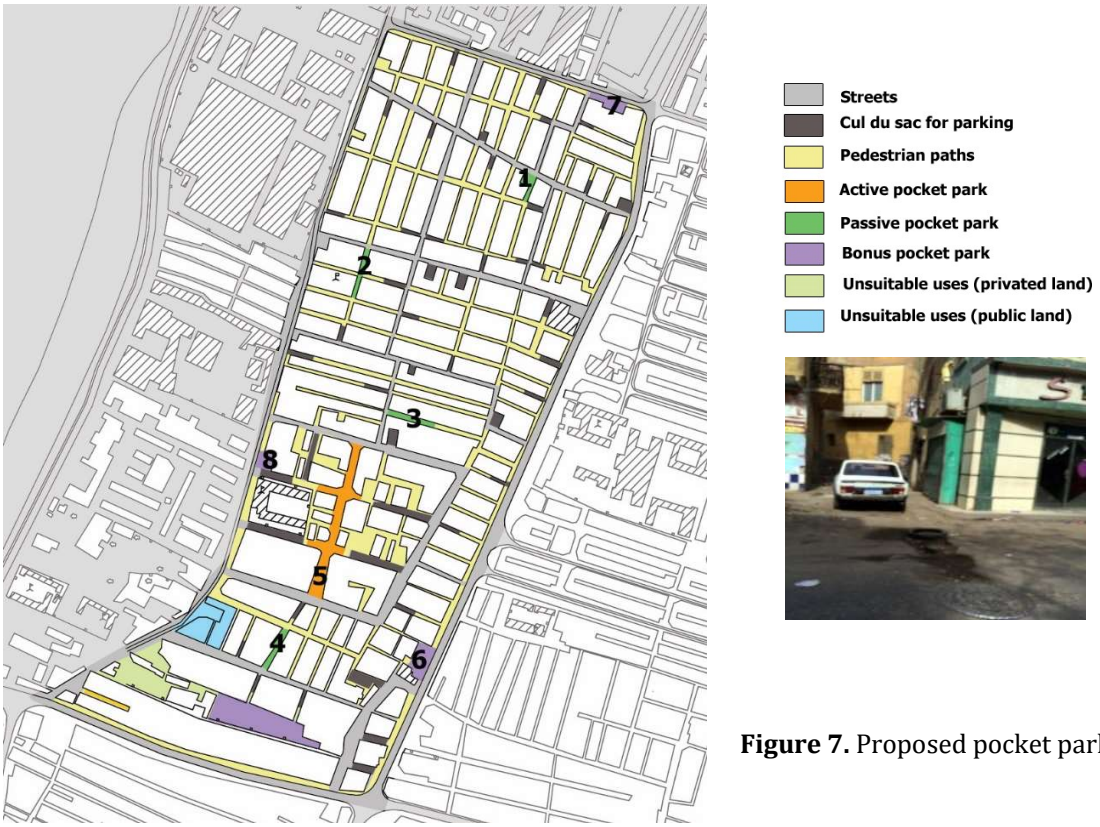

Figure 7. Proposed pocket parks' locations

7.5. Pocket park implementation

There are two types of land tenure in the area, the first are privately owned parcels. Theses parcels include streets and vacant lands. Transforming the streets to pedestrian paths and pocket parks would not be a problem, as it is approved by the owners due to the enhancement of the inner spaces in the neighborhood. On the other hand, reusing fenced vacant lands preserved for investment and not utilized is challenging. To utilize

such parcels, an agreement must be held between the local government and the owners, for instance, expropriating the land for the public benefit while offering suitable compensation. The second land tenure is parcels owned by the government, which can be reused to fulfill the need of green spaces and other services. Therefore, the study recommends transforming the deserted small leftovers, closed ended streets and public owned parcels as a first priority. As for the local participation, 54% of the interviewee believe that the government should be responsible for creating pocket parks in the neighborhood. Low income residents stated that they are not willing to pay. Nevertheless, 23% pointed out that they are willing to participate in the maintenance process and 17% pointed out that they and other residents would be interested in locating their activities (vendors/renting play equipment) in the parks to benefit from locals gathering.

As a result, the funding needed for the construction phase would be the responsibility of the local government, with exploring the possibility of NOGs participation. The local community can participate in the maintenance process under the supervision of local authorities; one way is collecting fees from local businesses featuring their services in the pocket parks (vendors, children's play equipment).

Table 3. Proposed pocket park characteristics

Pock park type	No. map	Area m2	Accessibility	Current use /activity	Exposur	Recommended Design elements
Passive	1	298	Pedestrian paths	Street/ young people Loitering Domestic chores	Medium	• Sitting area • Multi play area • Planning bed • Lighting/trash bins
	2	186				
	3	223				
	4	401				
Active	5	2600	Secondary streets and pedestrian paths	Streets/ Kids playing football Billiard tables	Good	• Playgrounds with playing equipment • Sitting area • Shrubs, Trees • Raised planters • Kiosks • Football court • Ceremony space • Recreational zone (billiard, ping pong) • Lighting/trash bins
Bonus	6	540	Main streets	Vendors, shop extension Or fenced land	High	• Sitting area • Vendor's kiosk • Shade trees • Lighting/trash bins
	7	347				
	8	394				

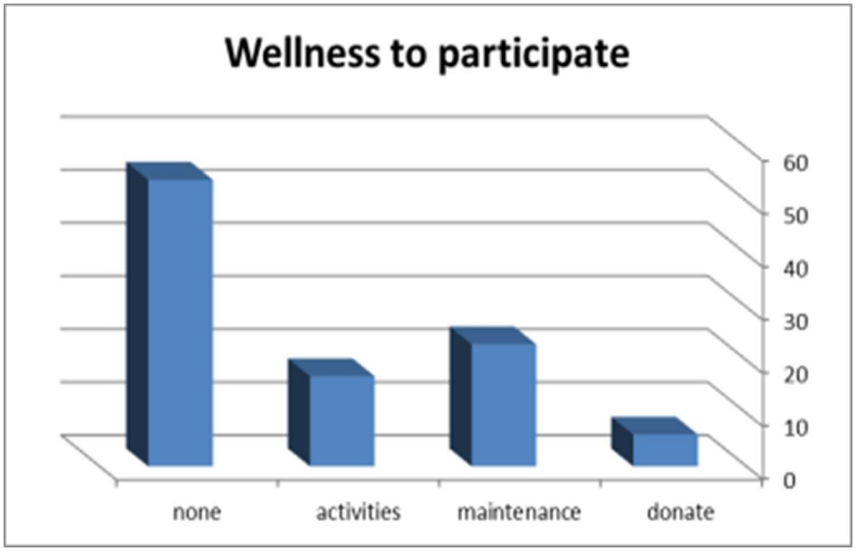

Figure 8. Residents' willingness to participate in creating and maintaining pocket parks

8. Discussion

This paper reports the results of an empirical study conducted in an informal, highly dense neighborhood in Cairo city. The aim of the study is to test the possibility of creating pocket parks with limited space and resources in the neighborhood. The study suggested converting selected streets and neglected spaces to pocket parks by redesigning those spaces and connecting them with pedestrian paths and vehicular traffic network.

The research concluded that there is a need for a smaller park system in high density areas that accommodates accessible and well-connected parks not only to each other, but also to a broader green network. Such small parks are to meet the recreational and the social needs of the local urban residents, especially the seniors' needs and the needs associated with early childhood development.

Further, the observation and questionnaire carried on in the study indicated that providing safe, flexible designs; places to socialize; natural surveillance for kids and cars; and accommodating different dynamic activities, especially celebrations and kids playing areas are the main design criteria for pocket parks in the Egyptian context. Moreover, it is found that land acquisition and providing sufficient fund are the main hurdles facing the expansion of pocket park in Cairo city; both problems could be conquered through the cooperation between the local government, non-governmental organizations and local citizens.

At the end, pocket parks have great potentials that not yet fully optimized by local governments. It is hopeful that more attention is drawn towards embracing them in improving the city open space holdings, and thus increasing the opportunity of a better quality of life for its dwellers.

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