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## **A STUDY OF THE CAUSES OF INEFFICIENT USE OF OPEN PUBLIC GREEN SPACES: A LITERATURE REVIEW**

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### **Abstract:**

Open public green spaces (OPGSs), such as parks and gardens, sports facilities and green corridors, play a significant role towards providing environmental, social, and economic functions and benefits to communities. Environmentally, they are air and water purification, wind and noise filtering, microclimate stabilization. In addition, they reduce stress, rejuvenate people, and provide peacefulness. Socially, OPGSs encourage the use of outdoor spaces, increase social integration and interaction among neighbors. Finally, its economic services include air purification by trees that reduces costs of pollution prevention; promotion of city as a tourist destination; and increase of property values. However, literature review and case studies showed that OPGSs are not fully satisfying their intended functions and benefits to communities. As an approach for increasing the sustainability of OPGSs, this paper aims to investigate the causes of inefficient use of OPGSs in Egypt. A research methodology based on literature review, is designed to build a comprehensive background of the research topic through reviewing the definition of OPGSs, functions and benefits of them as well as identifying the causes of inefficient use of OPGSs. The importance of this research emerges from the need to improve the environment, social and economic role of OPGSs and increase its sustainability. In addition, it raises the awareness of designers and proposes a criterion and guidelines to be considered during the design of OPGSs.

**Keywords:** open public green spaces, cause of inefficient use of OPGSs, criterion.

### 1 Introduction and Research Methodology

Due to their negative impacts on the society and human well being, environmental issues in Egypt are matter of serious concern. These issues include air pollution, water pollution and soil contamination. The formation of dust particles is more characteristic in Egypt than in any other industrialized country. It has been estimated that the air quality in downtown Cairo is more than 10 to 100 times of acceptable WHO standards (Hassanein, 2013). Cairo has a very poor dispersion factor because of lack of rain and its layout of tall buildings and narrow streets, which create a bad ventilation and consequent trapping of pollutants. Transportation, industry and open-air waste-burning are the most notable sources of dust and small particles. Another significant source is the windblown from arid areas around Egypt. The air in Egypt is very thick, gray and there is a haze over Cairo. Furthermore, other forms of air pollution in Egypt includes: sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>2</sub>) in urban areas. These pollutants are obviously a reason for respiratory diseases and cancer. Another concern of environmental issues is the noise pollution which is caused by blaring car horns, wedding parties that has reached alarming levels ranges from 90 decibels (dB) and never drop below 70 dB, like spending all day inside a factory. Noise pollution is a direct cause of many health problems (Hopkins and Mehanna, 2003), see figure (1).



Figure (1) Air and Noise Pollution in Cairo

OPGSs play an important role towards improving the surrounding environment and enhancing the health conditions of residents. This could be achieved through absorbing pollutants, releasing oxygen, providing clean air, water and soil as well as balancing the city natural environment. In addition, they act as a good visual screen, a sound barrier and avoiding spatial uniformity. Moreover, OPGSs help reducing stress, enhancing feeling of social safety, increasing social interaction and property values. Furthermore, they provide play spaces for children's development whether physically or mentally (Gupta, 2012). In spite of the given reasons to use urban green spaces, yet in Egypt, these spaces are not efficiently utilised. This could be attributed to a number of reasons such as lack of enough spaces, poor service and culture behaviour of Egyptians. OPGSs could be used to deliver social, physical or mental functions to the society and country at large. This paper aims to investigate the causes of the inefficient use of OPGSs in Egypt's neighborhood through focusing on the social function of OPGSs. In order to achieve this aim, a research methodology based on literature review, is designed to build a comprehensive background of the research topic through reviewing the definition, functions and benefits of OPGSs as well as identifying the causes of the inefficient use of OPGSs.

## **2 Open Public Green Spaces**

### **2.1 Definitions and Background**

#### **2.1.1 Open space**

Open space could be simply defined as any area in the urban environment that is not occupied by a building. For example, the Plan for London defines an open space as "All land use in London that is predominantly undeveloped other than by buildings or structures that are ancillary to the open space use" (Kellet, 2009). This definition actually covers all the open space in London whether public or private and whether the public ones are accessible or restricted. These definitions raises the question of, do roads, streets and spaces used by vehicles are regarded as open spaces?. Actually, they are not, because an open space is a space associated with an identified activity (Kellet, 2009). Despite having a physical activity in roads and streets such as the cyclists yet they are not considered as open spaces. For that reason a deeper definition of open spaces is yet need to be explained. According to the Scottish Planning Policy, it defined open space as green spaces that are covered by vegetation, water or any other geological feature within settlements or on the edges of them. It may include allotments trees woodland, paths and any other civic space that consists of squares, marketplaces and other paved or hard landscaped areas with a civic function (Kellet, 2009). Hence, green open spaces are spaces located within a neighbourhood, public or private, and covered with a landscape element whether hard or soft. Another definition explained by Oldenburg (2000) stated that open spaces are regarded a third place. With the concept of "the third place" which is neither home nor workplace Oldenburg meant this place as a "part of public realm where social encounter is enhanced". Of course it is not logical to call an open space as a third place, restaurants, bars and theatres could be also regarded as third places but not all of them addresses social physical activity.

Hence, a differentiation between “open space” and “public space” is required. Apart from the “Open space” definition described above, “public space” is any hard elements present in the urban environment. Thus, public open space is a combination between hard and soft scape in any urban environment.

**2.1.2 Open public space**

A space, in any urban environment, that occupies public access and can afford physical, amenity and recreational function (Kellet, 2009).

**2.2 Types of open public spaces**

There are four types of open public spaces, see figure (2)

**2.2.1 Green spaces**

Green spaces include parks that are designed for both formal and informal physical activities, playgrounds and other nature reserves (Kellet, 2009). Examples of open green spaces are parks, comfort spaces within housing areas, natural and informal open space, ornamental gardens and grass sitting out areas. (Rehan, 2013)

**2.2.2 Non green spaces**

Non green spaces according to Kellet (2009) are defined as all pathways that connect green spaces with roads or other land uses such as buildings.

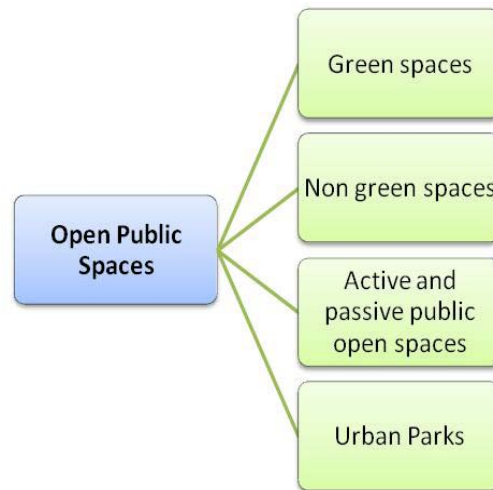


Figure (2) Type of open public spaces

**2.2.3 Active and passive public open spaces**

Active open spaces are those spaces that encourage sporting activities such as soccer. Active public open spaces may be hard non-green spaces such as basketball and tennis courts (Kellet, 2009). On the contrary, passive public spaces are those spaces filled with trees, landscape gardens, lawns, shrubbery, lakes, fountains, picnic areas and walking trails. They encourage sedentary activities such as walking (Cohen, 2009).

**2.2.4 Urban Parks**

Urban parks are sociable places where people go there, enjoy their time, observe passing scenes, meet and interact with other people. A good urban park should have good seating areas, shades and other amenities and facilities for people to benefit from. These elements make parks attractive to all genders at all ages. An efficient park as well should be visible and easy to access. Moreover, parks play an important role in the aesthetics and quality of the urban environment.

**2.3 Usage of open public green spaces: (Types of activities/needs)**

*“The main objective of park use was to spend time in the open air, to rest and contemplate by water and green areas, to meet and chat with friends and to get rid of the pressures of urban life” (Kaptan, 2008).*

### **2.3.1 Necessary activities**

Necessary activities are the activities that more or less compulsory, which means that every pedestrian is subjected to those activities. They do not need specific requirements to be performed. Examples for such activities are going to work and waiting for a bus. These types of activities are usually related to walking, but not walking for the purpose of walking instead walking for another purpose such as reaching a specific destination. They are usually performed under any conditions and within any urban environment. Thus, it is one of the activities that are obligatory where participants have no other choice (Johnson, 2002).

### **2.3.2 Optional/recreational activities**

Jen Gehl, a Danish architect, described those activities as the ones performed by the participant when he/she wishes to do so. They are those types of activities performed by people in order to enjoy, have fun and relax. Timing and place of the performed activity affects those types of activities. They are also affected by the exterior conditions of open green spaces such as weather and place. Examples of such activities are “waking to get a breath of fresh air, standing around enjoying life, or sitting and sunbathing.” (Johnson, 2002). Other examples could be taking a dog for a walk, having a pool operated in special timings and picnics and barbeque parties (McCormack, 2010). Results of a study based on 90 articles gathered from “landscape and urban planning” journal between 1991-2006 focused on the people interaction with urban environment, 40% of the articles addressed the recreational need. Recreational needs are described as those needs that result in the enjoyment of people. Recreational needs could be “walking, jogging, cycling, hiking and playing sports and games.” (Kaptan, 2008).

### **2.3.2 Social activities**

Among all types of activities, social activities are the most important ones. They are described as those activities that occur due to the presence of others in the open public green spaces. Examples of social activities include children playing, people greeting each other and finally passive contacts, meaning seeing and hearing other people. Passive contacts are regarded as the most important issue within social activities. Social activities are also associated with the social cohesion and social interaction of people. These activities could be improved through a successful designed open green space (Johnson, 2002) User participation in the design of open green spaces is essential for designing effective places that consider into account the culture, religion and history of a particular region while designing (Kaptan, 2008).

### **2.3.3 Physical activities**

The term physical activity is referred to any bodily movement produced by skeletal muscles that result in energy expenditure (Kellet, 2009). However, this definition is a little bit general. For a green open space to be effective it shouldn't

be designed for only one physical activity. Instead, an effective green open space will cater a diverse range of physical activities and uses. Physical activities are classified according to Kellen (2009) as passive ones, and often referred to as inactive behaviour, moderate activities such as walking or vigorous activities such as running and playing of team sports. Cohen (2007) studied the behaviour of people in parks in Los Angeles and concluded that adults who take their children to green spaces in order to play will be more encouraged to physical activities if there is more provision of adult oriented exercise equipment. Enhancing physical activities of adults is associated with children that use open green spaces as children will be coming with their supervisors. Beside children role in enhancing the physical activities, dogs plays a role in motivating physical activities (Baum, 2002).

### **2.3.4 Passive physical activities**

Passive or inactive activities are the activities that require no movement such as sitting. In fact, one of the highly activities performed in open public green is that type of activities. In their studies, Cohen (2007) and (Floyd, 2008) stated that 66% and %65 of users are performing passive activities and are considered “sedentary” users respectively. Based on both studies, although open green spaces can have enough potential for supporting physical activities, yet most of them are used by passive activities only. This raises an issue that the design of open green spaces could not be functional enough to support strenuous activities.

### **2.3.5 Moderate activities**

Such activities are those that do not need exercise equipment in order to be performed. Walking is the most dominant moderate activity preferred by almost all types of gender and age. Moreover, walking is regarded as an informal form of physical activity as it requires neither teams nor specialised equipment. Thus, it is considered the best equitable form of physical activity (Kellet, 2009). According to King (2003), walking was ranked as high activity associated with journeys to local shops (25.5%) and parks (20%). It has been concluded that amenities and aesthetics are not affecting the physical activity of a green space because there are many people that are not discouraged from walking despite being in poor environments (Lee, 2004). Given the previous conditions, Lee (2004) agreed that the more destinations a built environment contain, the more walking people appear putting in consideration good landscape elements connecting those destinations. This shows that conductive walkways promote more physical activities although Kellet (2009) argued that one of the main problems related to walking issues for elderly people is that everything is too far. Other problems related to walking issues for elderly people are walking is too hard, poor sidewalks, worries about crime, no place to rest, intersections between streets are too dangerous and last, time taken for walking.

### **2.3.6 Vigorous activities**

Vigorous activities are those types of activities that require a playground in order to be performed.

#### **2.4 Who uses open green spaces?**

Open green spaces are used almost by all ages, different genders and different social levels. In William Whyte study in 1970 in New York City, he stated that most open green spaces were used by workers from nearby buildings during launch hours. He also concluded that the size of group using a plaza is associated with the success of the open green spaces being used. He reported: “the best plazas have about 45% of people in groups while the least-used plazas have about 32% in groups” (Whyte, 1993). According to another study conducted at Al Rehab city, Cairo, most open green spaces located in the city were also used by a number of workers that take their launch there (Deister, 2013). Open green spaces are also used by children, adolescents and adults. Different types of activities are performed within an open green space, the age and gender of people uses these open green spaces differ accordingly. “For example, younger people throughout the world are attracted to more active pursuits such as sports, interactive play with landscape features, while adults and the elderly are more likely to enjoy nature opportunities that afford contemplation” (Kaptan, 2008). Open green spaces should also address disabilities. However, there are factors that affect the usage of these spaces. There are also different activities performed.

#### **2.5 Identification of causes of inefficient use of Open Public Green Spaces**

Literature review identified 9 causes that lead to inefficient use of OPGSs, see figure (3).

##### **2.5.1 Accessibility**

Kollet (2009) described accessibility as the ability of an individual to reach a specific green space. Furthermore, it is actually the ability to gain the activity performed in the green space. McCormach (2010) argues that open green spaces that are accessed within a walking distance are more associated with use. While driving to a green open space reduces the use of it. Moreover, location of a public transportation mean nearby highly affects access of open public green spaces. Green open spaces that are located in a walkable route from/to school are observed to be used more than any other ones located elsewhere.

##### **2.5.2 Safety**

Safety is one of the main issues that affect the use of green open spaces especially with adolescents. A study done by Babey (2008) deduced that the use of safe parks is relatively high compared to unsafe ones that are rarely associated with activities. Another study was held on the African – American women that reported that while there are women from a relatively low income neighbourhood uses open green spaces, other would not. This is due to personal

safety concerns. One woman commented: “I have a park right across from my house and I would not go over there if you paid me” (McCormack, 2010). This illustrates the importance of safety in open public green spaces despite being near and easily accessible. Vegetation in open green spaces can provide a cover for persons involved in illegal activities which result in reducing use of public green spaces (Baum, 2002). Therefore, the design of open public green space should balance between vegetation capacity and interests of public safety.

### **2.5.3 Management and maintenance**

Due to the nature of public open spaces that they are not a natural environment, it requires more management and maintenance. Maintenance should be held upon both hard “non-green” and soft “green” structures. In case of maintenance of hard structure, it is actually thought of as play and recreation equipment to ensure “safety, high quality, user friendly environment.” (Kellet, 2009) While for the soft structures, it is thought of vegetation and landscaping to ensure that vegetation does not overgrown thus creating invisible zones. Maintenance is one of the key factors that greatly affect the use of green spaces. Cleanliness, characteristics of playing surfaces were highly recommended by both adults and children. Some of the studies that were held described that the uneven grounds, lack of grass and poor quality sidewalks are major problems faced in open green spaces (McCormack, 2010) These problems negatively affected usage of green spaces. According to an interview performed in parks in one of the cities in Canada, the interviewee stated that, “it would be nice to have somewhere to go where the cement is not all cracked and the clay is not all like rubbery due to the usage.” In addition, the interviewee illustrated that the problem is not with the quantity rather than it is with quality. He said they do not need more parks; they need to fix them up (McCormack, 2010). Issues that affected the cleanliness of open green spaces were either presence of litter and the overfull of rubbish bins or the absence of rubbish bins in advance. In addition, people who take their dogs for a walk usually mess the gardens up in terms of condition and aesthetics. One of the interviewees in study held in one of the parks in Canada commented that, “They (the dogs) use it (the park) and mess it up” (McCormack, 2010).

### **2.5.4 Location**

The location of the public open green space highly effects usage of them. Cohen argues that the distance between the place of work or residence to the open green space should not be more than 1.6-2 kilometres. (Cohen e. a., 2007). While in an earlier study in 2006, it was proven that a distance of less than 1km from place of residence or work to open public green spaces is associated with high activity rates. (Cohen, 2006). In 2007 Cohen’s study, it was concluded that “64% of park users travelled less than 0.8km to access public green space while only 13% has travelled more than 1.6km” (Cohen e. a., 2007). The more a public green space is proximate, the higher physical activity is said to include (Cohen, 2007). Though, proximity is associated with directness. One cannot assume that proximity is directly proportional with physical activity without putting in consideration the directness issue. Directness is the physical activity performed



in the route taken to reach the destination. Therefore, public green spaces facilities that are within the proposed distance is said to be proximate. This proximity therefore is invalid if there is a lack in route directness. Enhancing proximity by emphasising directness will result in providing effective connectivity. (Cohen, 2007).

### **2.5.5 Features**

Features that are associated with open green spaces highly affect the usage whether negatively or positively. Findings of studies conducted on open green spaces in different countries showed that access to green spaces that contain a variety of activities for children and adolescents is relatively high. Activities, whether active such as sports or passive such as play, are important for frequent visit of those green spaces. Other facilities for children such as playgrounds and trees for climbing were also vital. Equipment placed in open green spaces for children to play were usually either “age-inappropriate, poorly equipped, outdated, or ornamentally unstimulating” which resulted in negatively affecting usage of green spaces (McCormack, 2010). A parent was interviewed and mentioned “We want to go to parks that are interesting. The closet park, we can walk to, but it does not interest my kids. It is a big park but the play equipment is too small and it only caters for younger children, 7-8 years old are not challenged there” (Veitch, 2006). As for adults, constructed and natural trails were important (McCormack, 2010). Other green spaces amenities such as “barbeques, seating, water fountains, picnic tables, shading devices and bathrooms” play an important role in access of those spaces regardless of the age (McCormack, 2010). Those were the commonly features that highly influenced the usage of green spaces while there were other specific such as dog litter bins and bags and other dogs’ equipment. Some studies stressed on the importance of those features for an open public green space (Cutt, 2008). *“Attractive features of the parks such as pleasant landscape and visual elements, near to water, peaceful atmosphere were listed as the primary reasons of the satisfaction by all users”* (Kaptan, 2008).

### **2.5.6 Lighting**

Lighting of open green spaces are vital for a number of reasons. During the daylight, the presence of light fixtures in a space creates a sense of good surveillance and management. As for the night, lighting avoids the presence of anti-social and illegal activities (Kellet, 2009). Lighting play a necessary role in the safety issues of an open green space. Providing more sufficient lighting increase the opportunity of users to see and be seen that result in good safe atmosphere (McCormack, 2010).

### **2.5.7 Aesthetics**

Aesthetics is one of issues that affect usage of open green space. People with different ages still enjoy sitting in a clean beautiful place. Litter, uncleanliness and rubbish negatively affect visiting green spaces Kaptan (2008). Presence of trees and bushes, gardens, grass, flowers, natural settings and water features are other aesthetics features that also affects usage of open public green spaces. In

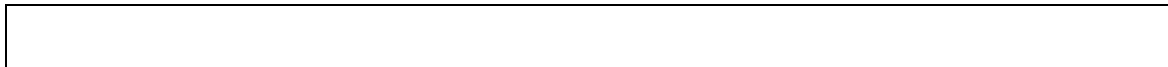
addition to air quality, the presence of alternative flowers smell plays an important role in encouraging people to use those spaces. Green spaces that are covered with fumes and smog are less accessible, while those who have good air quality are more accessible. That's why; open green spaces should be somehow placed in a location where there is no air pollution. Moreover, natural sounds and quietness make open public green spaces more pleasant and enjoyable (McCormack, 2010). Furthermore, wildlife that are created due to the presence of natural green space are most welcomed by people from all ages.

### **2.5.8 Amenities**

In order to encourage people to use a specific open green area, there should be some amenity functions such as “water fountains, restrooms, barbeques, picnic areas, seating, signage, and shade” (McCormack, 2010). Both adults and children recommend the presence of those elements. People seek a place where passive and active activities can be performed. These types of amenities when present in open green spaces increase rate of physical activities. Not only does it increase the rate of physical activity but also increase the time spent in these areas. Moreover, open green spaces that are associated with walking paths and trails are more accessible than those that have sports-related facilities. Gavin (2010) concluded that passive activities may lead to incidental physical activity. Although, Kellet (2009) argues that an effective green open space is that space that contain variety of activities not only one type of activity. Putting children in consideration, when studying usage of open green public spaces, is an important issue. Children increase the rate of people visiting a specific open green space. This is due to having care givers and parents that supervise their kids. Hence, according to some studies that were explored, it had been concluded that children are willing to visit any open green space regardless of its location. They do not think of the route or the time taken. They do not even prefer nearer parks. All their concern is about the amenities and features presented in this specific green space (McCormack, 2010).

### **2.5.9 Presence of other people**

William Whyte studied the behaviour of people in different parks, playgrounds and city blocks since 1970 in New York City. Results from his study stated that people want to escape from the crowd and other people although they totally do the opposite. People tend to go the spaces where other people exist (Whyte, 1993).



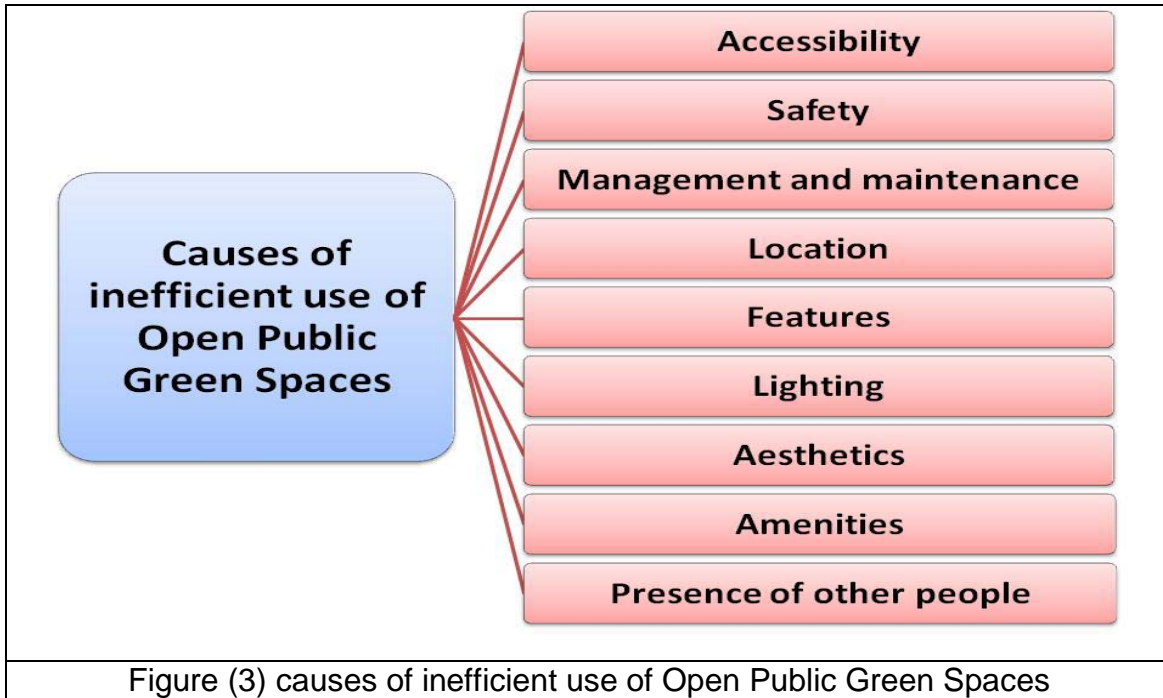


Figure (3) causes of inefficient use of Open Public Green Spaces

### 3 Research Conclusion

The diverse impact of air and noise pollution as well as water contamination on the society and human well being is matter of serious concern. OPGSs play a crucial role towards improving the surrounding environment and the health conditions of residents. This is accomplished through absorbing pollutants, releasing oxygen, providing clean air, water and soil as well as balancing the city natural environment. In addition, OPGSs act as a good visual screen, a sound barrier and avoiding spatial uniformity. Moreover, they play a role in reducing stress, enhancing feeling of social safety, increasing social interaction and property values. Furthermore, they provide play spaces for children's development whether physically or mentally. In spite the obvious benefits of OPGSs, these spaces are not efficiently utilised. This paper aimed to investigate the causes of the inefficient use of OPGSs in Egypt's neighborhood through focusing on the social function of OPGSs. In depth revision of literature review showed that green open spaces should have more than one physical activity in order to be an effective green space for use. In most of times people do not visit the green open spaces by themselves, whether to supervise their children or to take their dogs for a walk. Design, location, amenities and aesthetics are all key factors that should be put in consideration to create a functional green open space that serve physical activities. It has been concluded that factors affecting usage of open green spaces varies according to the gender, age and social level. Open green spaces should be designed to discourage isolation and encourage sociability. However, there are some general factors that truly increased the number of users in open public green spaces such as seating areas and safety. People would go an open public green space to sit first and foremost. Safety is highly recommended from all ages and genders.

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