Green Open Space, Towards A Child-Friendly City (A Case Study in Lembah Gurame Park, Depok City, Jakarta Greater Area, Indonesia)

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Abstract. Green Open Space (GOS) is essential to provide a critical ecosystem service that reduces the social stress levels of a community living in densely-populated urban areas. Children, as part of an urban community, are often most affected by the lack of green space. Government seeks to fulfill these rights through its Child-Friendly City (CFC) program. This study aimed to analyze whether the existing GOS had meet the criteria of child-friendly GOS. This research was conducted in Lembah Gurame Park, as one of the urban GOS in Depok City as a part of Jakarta Greater Area. This study employed spatial analysis using GIS and conducted interviews to the visitors to find out the needs of the children on GOS. This study observed the design and management of the Lembah Gurame Park in accordance to the principal of Child-Friendly GOS including landscape, facility and utility, park furniture, flora and fauna, as well as human activities in the Lembah Gurame Park. This study found that the design and management of the GOS is below the optimum for child-friendly GOS. Many facilities and utilities are dangerous for children and very limited activities can be involved by children.

Keywords: Child-Friendly Cities, Green Open Space, Lembah Gurame Park

1. Introduction

Green open space is a space that is planned to meet the need of community interaction and joint activities, the space also serves as an active playground for children and adults [1]. The benefits of GOS are environmental benefit, economic and aesthetic benefit, as well as social and psychological benefit [2]. Green Open Space is an external public space where this type of public space is usually in the form of outside space that can be accessed by all people (public) such as city parks, squares, pedestrian paths, etc [3]. In 2011, UN-Habitat adopted resolution on sustainable urban development through access to quality urban public spaces. The proposed Sustainable Development Goals highlighted Public Space as a key and important topic. “Sustainable Development Goals, (Proposed Goal 11 Target 7 – By 2030, provide universal access to the safe, inclusive and accessible green and public spaces, in particular for women and children, older persons and persons with disabilities)”.

Urban area with very rapid development often overrides the need for GOS. The number of GOS has been declining with the building and pavement. For example, Jakarta with a total area of 649.71 km², in 1982, its GOS was around 40% of the total area. But in 2013, there was a drastic decline, leaving only 17% of the total area of Jakarta [4].
In the 1989 Convention on the Right of the Child which has been ratified by the Indonesian government through Presidential Decree No. 36 of 1990 concerning the Ratification of the Convention on The Rights of the Child, it was stated that children are those aged 18 years and under. To be able to grow and develop properly, children need an open space for playing, learning, exercising, and recreation. All those activities are very important to the practice of psychomotoric, cognitive, and affective skills. The density and spatial patterns of urban land and green spaces are considered in landscape and urban planning so that urban areas and cities can be a healthier and more comfortable urban environment to live [5].

Children growth is related to the changes in the weight, length, bone age, and the metabolic balances (body calcium and nitrogen retention). Development is the increase in skill (ability) in the structure and function of the body that is more complex in a regular and predictable pattern, as a result of the maturation process. Including also emotional development, intellectual, and behavior as a result of interaction with the environment. So it can be concluded that growth has an impact on physical aspects, while development is related to maturation of organ / individual functions. Nevertheless, both events occur synchronously in each individual [6].

The Ministry of Health of the Republic of Indonesia (2006) mentioned that the developmental aspects that can be monitored includes gross motion, subtle movements, speech and language skills, as well as socialization and independence. Three of four aspects can only be fulfilled by the presence of GOS as a place for children to practice gross motoric skills and to interact to practice language skills and psychosocial skills. Playing together is very important for children. Social forms of playing helps children to learn how to cooperate with one another and get beyond their self-centered perspective to try to see the world of the eyes of other people [7].

2. Methods

2.1 Research Area

The location of the research is at Lembah Gurame Park, the biggest park in Depok City. We selected Depok as the sample of observation, due to the majority proportion of children-age population in Depok, the suburban of Jakarta Metropolitan Area.

![Figure 1. Studi area Depok](source: Map of Rupa Bumi Indonesia, BIG (2016), Aerial Photo Interpretation (2018))

2.2 Indicator Observed

This research employed spatial analysis using the Geographical Information System for the distribution and the accessibility of the GOS. In accordance to the analysis of child-friendly GOS, this study observed the design of the existing GOS with the standards including the material, pedestrian path, themes, furniture, and park facilities.
2.3 Interview and questionnaire
This research conducted interviews the children-aged visitors of Lembah Gurame Park find out their motives of visiting park, the distance from their house or school, the frequency of visiting the park, the activities they do while in the park, and their opinion to the infrastructure and flora-fauna in the park. This research also observed their activities in the park.

3. Results and Discussion

3.1 Population Characteristic
Depok City is located in the south of Jakarta. As a buffer city, Depok is growing rapidly along with the development of Jakarta. Depok City consists of 11 sub-districts and 63 urban villages with a total area of 200.29 km² with a population of 2,254,513 or a density level of 11,256 people/km². As a metropolitan buffer city, settlements in Depok City are mainly residential for commuters who work every day in DKI Jakarta. As a residential area Depok City has a high number of children, where for children aged 0-19 years it reached 784,649 people or 34.8% of the total population.

Tabel 1. Children Population by age

| Child age group | Total  |
|-----------------|--------|
| 0-4             | 221,122|
| 5-9             | 195,593|
| 10-14           | 175,931|
| 15-19           | 192,003|
| Total           | 784,649|

Source: Depok in number, 2018

3.2 Green Open Space
According to Minister of Public Works Regulation No. 05 / PRT / M / 2008 concerning Guidelines for the Provision and Use of GOS in Urban Areas, park area is classified into three classes, namely: narrow (less than 1,250 m²), medium (1,250–9,000m²), and wide area (more than 9,000m²) [17]:

| Classification | Name of the Park | Area (m²) |
|----------------|------------------|-----------|
| Narrow         | Bunga Pratama    | 326       |
|                | GTP              | 396       |
|                | BDN              | 893       |
|                | Sehat Koperasi   | 600       |
|                | Anantakupa       | 708       |
|                | 15 Cinere        | 1000      |
|                | Dahlia           | 1083      |
|                | Pijar            | 1131      |
|                | Markisa          | 1410      |
|                | Jembatan Serong  | 2500      |
|                | Lingkar UI       | 5000      |
| Medium         | Lembah Leli      | 6000      |
|                | Jatijajar        | 6000      |
|                | Balaikota        | 7000      |
|                | Sukatani         | 7000      |
| Wide           | Lembah Mawar     | 14000     |
|                | Merdeka          | 15000     |
Depok City is a buffer zone for the capital city of DKI Jakarta. The current public green open space is only 2,015.53 hectares or 10% of public green open space out of the total area of Depok City, where it should have a public open space of 20% of the total city area [18].

3.3 Lembah Gurame Park
Lembah Gurame Park is located in Depok Jaya Village, Pancoran Mas District, Depok, with a total area of 36,000 m². This spacious park is located right in the middle of the Depok I Housing area. Which means, it is surrounded by residential areas that are quite dense beside the trade and education areas. The following is the map of Lembah Gurame Park and its surrounding land use.

![Map of Lembah Gurame Park](image)

**Figure 2.** (a) Land use surrounding Lembah Gurame Park and (b) lay out of Lembah Gurame Park

Source: Map of Rupa Bumi Indonesia, BIG (2016), Aerial Photo Interpretation (2018)

From the picture of land use above, it can be seen that the Lembah Gurame Park is surrounded by settlements, education, and worshipping place. In the area known as Depok 1 area, this is an area developed for settlements, in other words, there are many children in this area. The location of the Lembah Gurame Park is relatively close to the settlements, so school-age children can reach it easily. Whereas for those who are located some distance away, most of them use motorcycle mode with a travel time of 5-10 minutes. The layout of the Lembah Gurame Park and pictures of infrastructures are as follows. Lembah Gurame Park is a fairly complete GOS covering ecosystems of artificial forests, pond ecosystems, and urban ecosystems where all are combined as a harmonious ecosystem. The facilities inside are quite complete starting from the game, sports, fitness, jogging track, gazebo, etc. The function of GOS must be prioritized by maintaining the existing flora and fauna well, but besides that, the function as a public space must be maximized especially as a child-friendly public space, so that the Lembah Gurame Park can play a role in supporting children's development in Depok, where to achieve this goal, there are components that must be met by green open space.

3.3.1 Landscape
The landscape in Lembah Gurame Park is very varied, there are elevations and declines in several places with conditions of paths not perfectly connected or sometimes in the form of steps that are not friendly to the disabled using wheelchairs or baby strollers. The paths are also in a damaged condition, and at some point, they need to be added handles for safety, for example on the edge of the pool. Lembah Gurame Park is crossed by an artificial river with a pond in the middle. This signifies that this area serves as a catchment area that accommodates runoff water from the surrounding area. This is very useful, though the river that crosses this area is dirty and smelly and inundated. Therefore, it is necessary to maintain the cleanliness of the river that goes through this area. Besides that, it is
necessary to have a safety fence, especially in ponds with a certain depth because it will be very dangerous if children fall into the river.

3.3.2 Park Facility and Utility.
The control of the design of a children's playground was based on the function as an area of development of the creativity of the social soul, senses and self-development of children so that they can obtain pleasure. Therefore, the playground must meet the following criteria [15]:

- Ensuring safety, security and health of children to play in public spaces.
- Creating comfort and convenience for all children (healthy and with physical and mental limitations).
- Creating aesthetic visual harmony with the character of the surrounding area.
- Providing clarity about the function of the game equipment and the strength of its construction.

The facility contained in the Lembah Gurame Park in the form of sports facilities is only one futsal field, which means that it cannot accommodate the needs of residents, there needs to be additional sports fields. Playing facilities for children are quite a lot but many conditions are damaged, which is considered to be unsafe. There needs to be revitalizations and the additions of areas of dexterity and traditional games.

![Figure 3. The Broken Playing Facilities](image)

Source: Primary survey, 2018

Social facilities such as multipurpose rooms do not exist yet and need to be added so that they can be used as an indoor play area, besides as a place for community activities such as recitation, posyandu, etc. Other social facilities that need to be added are the nursing room and prayer room, so that visitors can enjoy the park to the fullest. Economic facilities do not yet exist in this region, considering that people usually buy food from street food vendors in the area, therefore, for example kiosks that sells healthy food in areas with good health and hygiene monitoring are plausible. This facility can also be managed by the surrounding community as a source income. Based on observations and interviews, the biggest problem in Lembah Gurame Park is the problem of waste, it is necessary to have good hygiene management.

3.3.3 Flora and Fauna
The existence of biotic elements, namely flora and fauna, are a must for green open space. Biotic elements in green open space generally consist of humans, plants, and animals where all three must exist and interact with each other. Urban and suburban parks can play an important role in the conservation of biodiversity [8]. The human experience is increasingly defined within an urban context. The results highlight that cities can support both biodiversity and people, but retaining these connections requires sustainable urban planning, conservation, and education focused on each city’s unique natural resources [9]. In the child friendly concept, biotic elements are very important as a learning process where children can get to know common flora and fauna around them. Being able to see them directly and possibly to touch them, is of course a very good stimulus in the child's
development process. Psychologically, biotic elements such as plants and animals can provide much needed calming sensation for children who live in densely populated areas.

The existing flora consists of large trees, flowers, shrubs, grass, to water plants. The dominant trees are trembesi (Samanea saman) and breadfruit (Artocarpus altilis) with large and shady canopy. Shrubs and flowers also thrive even though they seem untreated. There is a need for efforts to prune plants, especially branches that are fragile to make them tidier and not endangering visitors. The fauna seen in pond and river ecosystems in Lembah Gurame Park consists of Gurame (Osphronemus goramy), Sepat (Trichopodus trichopterus), Catfish (Clarias), and Guppy (Poecilia reticulata) and Frogs (Fejervarya cancrivora). In addition, in the trees, Sparrows (Passeridae), Pigeons (Columbidae), Lizards (Lacertilia), and Cats (Felis catus) are seen. For insects seen, there are Grasshoppers (Caelifera) and Butterflies (Rhopalocera) especially in flowering shrubs.

3.3.4 Human Activities. there are 3 (three) activities that are often done by the community in this place, which are playing, exercising, and relaxing [10]. These public parks could be an option for urban tourism both for Jakarta residence and tourists, since it is accessible as well as free of charge. With no entrance fee, public parks are suitable for every class and age [11]. Despite the rise of interest in child-friendly cities, urban planning and design is mostly adult-centered [12]. For children and adolescents, contact with nature is also associated with lessening of stress and emotional problem [13]. Quantitative evidence confirmed a positive association between presence of trails, playgrounds, and specific type of sports fields with GOS visitation and Physical Activity whereas safety and aesthetics seemed subordinate [14].

Based on the results of the interview, the travel time between visitor's house and the Lembah Gurame park varies from 5 minutes to 1 hour. Most of the visitors are residents of surrounding settlements or school students around the park, but for those with long distances usually due to the interest to gather with the community. From the results of observations and interviews, it is known that Lembah Gurame Park is one of the reference parks for several communities to gather regularly, including the Cat Lovers Community, Music and dance Community, Skateboard Community, and Volunteers of Community Book Reading in the Park. Various types of communities chose to gather here because of its location which is easily accessible and has sufficient area for creativity. Seeing the enthusiasm of the community here, the function of GOS as a public space for interaction is very vital, especially that some of the community activities can also be attended by the general public, especially children. For example, the Community who lends free reading books to children accompanied by routine storytelling visits this park every Sunday afternoon. The main purpose of children visiting GOS is for recreation, for playing and socializing. For school students, most of them come to exercise or to do school work that they do in the gazebos which are mostly available here.

The duration of the visit also varies between 1-4 hours, for parents and toddlers the duration is about 1 hour, but in adolescents it tends to be longer i.e. 2-3 hours, because of the need to exercise and do schoolwork. The longest duration is in the average, where the average reaches 4 hours due to the type of interesting activities and the same interests among them. Its location in a densely populated residential area in the middle of the city becomes cheap and affordable recreational place for the community. Lembah Gurame Park creates a feeling of recreation, so visitors always repeat their arrival, especially at the end of the week. The function as a public space can be maximized by the addition of several public facilities, while maintaining its function as open green space. For example, among the trees, you can add healthy food kiosk facilities, waste processing training facilities, nursery facilities that can be added to the education function for the community and especially children.

4. Conclusion
In terms of accessibility, Lembah Gurame Park is very easy to reach and right in the residential area. From the results of observations and interviews, the function of the Lembah Gurame Park as GOS has been very good with complete pond and artificial forest ecosystems. But to maximize the function as a child-friendly public space, it is necessary to have more comprehensive management, both physically
and non-physically in Lembah Gurame Park. There are still many facilities that are dangerous for children. Besides that, it is not supported by facilities and activities that support children's growth and development, which include cognitive, affective, and psychomotor ability. Therefore, it is necessary to add facilities and utilities that are oriented towards children's education, as well as to maximize family time in this GOS. Facilities and utilities provided must be child-friendly both in terms of material and design so as not to endanger them. The main factor that is needed is the existence of activities that attract children to come and feel at GOS, in the form of activities that have an educational element and cooperation for children. Activities must be initiated by the manager by involving children and carried out continuously with different interesting themes for children.

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