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Child-friendly green open space to enhance the education process for children

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Abstract. Social problems arise from the high level of community stress in urban densely populated areas, which the most affected are children. Children need open space to play, learn, exercise, and recreation to grow and develop as well as for cognitive, affective and psychomotor skills but urban development often excludes the need for Green Open Space (GOS). Based on Convention on the Rights of the Child In 1989, children as part of the community has a fundamental right to grow and develop appropriately that must be met. The Indonesian Government seeks to fulfill the rights of children through the Child-Friendly City (CFC) program by providing child-friendly GOS, which the common problems are the scarcity of land in urban areas and the green open spaces which are not child-friendly. This research analyzed using life cycle interaction between nature system: biotic (plants, fauna), abiotic (water, climate), and human system (children, family, communities) in GOS to enhance the education for children in the urban area in Indonesia. This paper aims to review the GOS whether it has complied with a child-friendly and efforts should be made so that the existing GOS into a child-friendly and enhance the children education.

Keywords: Child-Friendly City, Education, Green Open Space, Life Cycle

1. Introduction

Green Open Space is essential to provide ecosystem services that reduce the social stress levels of people living in densely populated urban areas. Green open space (GOS) is a space that is planned to meet the needs of the community interaction and joint activities. Space also serves as a place of active play for children and adults, passive space for adults and a green conservation area [15]. GOS benefits are environmental benefits, economic benefits, and aesthetics, as well as social and psychological benefits [16]. The meaning of green open space is the external public space where public areas are forming outside, that can be accessed by everyone (public) such as city parks, squares, pedestrian paths, and others [1].

In 2011, UN-Habitat adopted a resolution on sustainable urban development through access to quality urban public space. The public rooms are both increasing community cohesion and promote health, happiness, and well-being of all citizens and to encourage investment, economic development, and environmental sustainability. Proposed Sustainable Development Goals (SDG's) highlights Public Space as an essential topic. "Sustainable Development Goals, Proposed 11 Goal 7, 2030, provide universal access to public spaces and green safe, inclusive and accessible, especially to women and children, the elderly and the disabled".

At the Convention on the Rights of the Child in 1989 which has been ratified by Indonesia through Presidential Decree No. 36 of 1990 on the Ratification of the Convention on The Rights of The Child states that children are those aged 18 years and under. Children have a right to grow and develop which is protected by law. The central government through the Ministry of Women's Empowerment and Child Protection initiated a Child-Friendly City (Kota Layak Anak-KLA) in cluster



4 (education, use of leisure time and cultural activities), among others, to provide the facility for creative activities and recreational, outside schools, which are accessible to all. KLA program through Presidential Decree No. 1 of 2010 entered into national priority programs, with the main goal is the fulfillment of the child's rights.

There are four age groups of children (students) is associated with the learning process [20], namely:

1. Pre-school students (aged 3-5 years)
2. Elementary school students (aged 5-9 years)
3. Secondary School Students (aged 9-12 years)
4. Second-level students (aged 13-15 years)

To be able to grow and develop properly, children need open space to play, learn, exercise, recreation, which is very important for children's development and skills training of cognitive, affective and psychomotor. Growth associated with the issue of changes in large, quantity, size or dimensions of the level of cells, organs and individuals, which can be measured with a measure of weight (grams, pounds, kilograms), length (cm, meters), the age of the bones and the balance metabolic (body's retention of calcium and nitrogen). The development is increasing skill (ability) in the structure and function of the body is more complicated in a regular pattern and can be predicted, as a result of the maturation process. It is about the process of differentiation of the cells of the body, the body's tissues, organs, and organ systems are developing such that each can fulfill its function. Including the development of emotional, intellectual, and behavior as a result of interaction with the environment. It can be concluded that growth has an impact on the physical aspect, while the developments related to the maturation of the organ functions/individuals. Nevertheless, the two events occur synchronously to each [4].

The Ministry of Health of the Republic of Indonesia (2013) mentions the aspects of development that can be monitored include gross motor, fine motor, speech and language skills, as well as socialization and independence.

1. Gross motor movement is an aspect related to the child's ability to the move and posture that involves large muscles, such as sitting, standing, etc.
2. Fine motor movement is an aspect related to the child's ability to perform movements that involve certain body parts and carried out by small muscles but requires careful coordination like observing something, pinching, writing, etc.
3. Speech and language skills are aspects related to the ability to respond to voice, speak, communicate, follow orders, etc.
4. Socialization and independence are aspects related to the child's ability to their-self (self-feeding, picking up toys after playing), separation from mother or nanny, socialize and interact with their environment, etc.

The presence of green open space can meet four aspects above as a place for children to practice motor movement and interaction of language skills and psychosocial. Playing together is very important for children, in the most general sense, social games encourage children to focus on the underlying rules of the episode and make them aware that certain rules underlies all social interaction. Social games facilitate the integration of children with their peer groups, a particular benefit for a child who is socially closed. The forms of social games help children to learn how to cooperate and transcend their selfish perspective to try to see the world through the eyes of others [5].

Singapore has been succeeded to make a good public space with a PLACES model, which is the acronym of this program, "People+Programing" is a way to attract people, "Lush Landscaping" is a way to bring nature to the city, "Accessibility" is how easy to be accessed, "Comfort" is how to make people comfortable, "Excellence in design+Eye for detail+Enganging" is about aesthetics, and "Sense of delight+Sharing of spaces" is about interaction between people [24]. In Singapore reported

unstructured play and natural contact, reduced time spent outdoors and associated 'educational pressure' could contribute in instigating policy debate. Two built environmental aspects, among others, came to the foreground of the planning and housing (re) design discussion: road patterns with a specific focus on children's access to outdoor places, and the co-presence of facilities where a diverse group of people can interact and see each other. We suggest further research on the ways to enhance the child friendliness of urban areas by taking integrated planning and (re) design approaches involving all relevant stakeholders [25].

In urban areas with high population density, GOS is necessary. GOS existence can encourage interaction between people and the environment in which children as part of the urban community most affected by the impact of the lack of green open space because the excellent growth and development of children can determine the future of the nation.

2. Methodology

Observations and interviews were conducted with a purposive sampling method in which the research is done by observing the large-scale green open space in Greater Jakarta neighborhood that is considered to represent the urban character in Indonesia. In accordance to analysis the 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.

The literature review was used to measure the real condition with a decent standard for GOS in urban areas that can support growth and improve the education process in children. The observational methodology can be used as a valid instrument in psychosocial research, especially when analyzing the dynamics of urban public space [8].

Life Cycle Interaction used to review how the suitability of GOS in urban areas with a child-friendly concept and identify the factors that shape a child-friendly GOS to create interaction among children and exist in harmony with the environment. Child-friendly green open space should be able to meet the needs of growth and development and learning of children as defined in bloom taxonomy that includes cognitive, affective and psychomotor.

3. Result and Discussion

The planning of GOS in an urban area is often not comprehensive, done without sufficient research as well as the lack of coordination between stakeholders. Lack of data generates broader institutional failures related to the planning, management, and research of urban green infrastructure, including a lack of awareness of the need for GOS (e.g., connectivity) and benefits (ecosystem services), and political indifference related to urban GOS [7]. Specific characteristics of the pattern of the use of public spaces studied by analysis of the differences concerning gender, age, and origin of users, as well as the diversity of use found and the influence of environmental variables [8].

Urban Green open spaces are often less attention on child-friendly so that cannot function optimally to support the development of the child. How to make the existing GOS meets the requirements of child-friendly and what efforts should be made to achieve a harmonious life for children in urban areas.

The Jakarta administration through a program of Integrated Child-Friendly Public Spaces (RPTRA) have attempted to provide a child-friendly green open space which has built 289 RPTRA, and more than 150 RPTRA will build in 2018 [19]. The user of RPTRA in Jakarta especially are children who use RPTRA to play and study, women using RPTRA most, and elderly people using it at least, the presence of small space in urban is a valuable asset in the daily lives of children and citizens state, RPTRA be taken into account for future planning of densely populated urban areas [6]. RPTRA in Jakarta, under the auspices of the Office of Woman Empowerment, Child Protection and Population Control (Dinas PPAPP). In practice, there are pros and cons between RPTRA function as a public space or as a green open space for the extent of diminishing green areas changed to pavement for

RPTRA facilities. Therefore, the future needs the grand design for a child-friendly GOS where the function is maintained but can provide a learning function for children.

3.1 Biotic

The biotic element in the GOS generally consists of humans, plants and animals where all three are there and interact. Urban and suburban parks can play an essential role in the conservation of biodiversity [9]. The integration or segregation of land-use planning and management in agroforestry landscapes is driven by water resources, biodiversity, livelihoods, economic factors, land-use planning, culture, and governance [9].

Any small GOS located in densely populated areas will be very significant in maintaining harmony for biodiversity. In urban areas, the fauna that can be encountered certainly fauna that has been through a phase of adjustment with dense urban neighborhoods and polluting, such as sparrows, lizards, insects, etc., but the overall mix of the biodiversity of species in urban areas reflects the uniqueness of living things the local geographical area.

Understanding the structure, composition, and history of biodiversity in these regions is therefore paramount to reconciling human development with the maintenance of existing diversity and ecosystem services. The human experience is increasingly defined within an urban context. Our results highlight that cities can support both biodiversity and people, but retaining reviews these connections requires sustainable urban planning, conservation and education focused on each city's unique natural resources [10].

On the concept of child-friendly, the biotic element is essential as a learning process in which children can get to know flora and fauna in the surrounding public can see and touch directly is undoubtedly an excellent stimulus in the process of child development. Psychologically biotic elements such as plants and animals can give you the peace that is needed for children who live in densely populated areas.

3.2 Abiotic

World Health Organization (WHO), "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. According to WHO, a healthy city aims to provide a high quality clean and safe physical environment (including housing quality), a stable and sustainable ecosystem in the long run, a robust, supportive and non-exploitative community, high levels of participation and control by citizens on decisions that Affect Reviews their lives, health and well-being, meeting basic needs (food, water, shelter, income, salvation and work) for all the city people, can be accessed by people with different experiences and resources, with opportunities for a variety of contacts, interactions and communications, a diverse, vital and innovative economy, a connection with the past, cultural and biological heritage of city dwellers and other groups and individuals, the shapes are compatible with and Enhance the previous characteristics, the optimal level of health care and Appropriate public health care, accessible to all and high health status (high levels of positive health and low level of disease).

From the definition above shows that healthy is not only influenced by internal factors, but external factors influence most of it. GOS as a component of the city should be able to function for a healthy society, through the availability and balance of abiotic elements. Abiotic components into one of the attractions to visit GOS, other than because of their beauty as well as the facilities that can be utilized by the community.

The abiotic components contained in the GOS, among others:

1. Landscape: land surface formations that exist in the GOS should be sloping, easily implemented and can be used to move, not steep and dangerous.
2. Water: GOS can function as a water conservation area, for example by making infiltration wells and planting certain types of trees that can store water.
3. Air: The presence of trees would become a sustainable source of oxygen.

4. Climate: The presence of GOS provide moisture and reduce heat.
5. Amenities: Includes sports facilities, social facilities, children's play facilities and so forth.

3.3 Human-System

GOS in densely populated areas should be a forum for people especially children to socialize healthily. Need for educational activities that appeal to children other than physical activity. The presence of facilities and infrastructure makes people interested in visiting the GOS, there are 3 (three) activities that are Often done by the community in this place are the play, exercise, and relax [11].

People and communities should participate in managing GOS to be active and interesting. Reviews public parks could be an option for both for Jakarta urban tourism and tourist residence since it is accessible as well as free of charge, with no entrance fee, public parks are suitable for every class and age [12].

Despite the rise of interest in child-friendly cities, urban planning and design are mostly adult-centered [13]. For children and adolescents, contact with nature is also associated with less stress and emotional problems [14]. Psychoevolutionary theory of Ulrich (1983) claimed that exposure to natural areas that are perceived to be safe is inherently restorative because such settings were associated with survival during humanity's long evolutionary history. Therefore physiological levels of stress drop in secure, natural environments and feelings of well-being rise [14]. Green open space is a space planned to meet the needs of community interaction and joint activities. Space also serves as an active playground for children and adults, a passive space for adults and as a green conservation area [21].

3.4 Urban Child-Friendly Green Open Space

How is an attempt to meet the need for green open space?, there are some efforts for the provision of GOS, namely: First, the government must determine the area that should not be built. Second, the government put forth a new green land with land acquisition and cooperation with the community for the provision of self-help as well as with the private area in the form of CSR. Third, the government can develop a green corridor of the city, such as along the arterial road, rail or river. Fourth, the government acquires private GOS by way of application of the rules permit that woke area restricted by law. Fifth, the government could refunction, rehabilitate, and restore the existing GOS to improve the quality. Sixth, the government greening the city skyline by creating a vertical garden and take advantage of the building's roof. Seventh, green policies need to be arranged so that all policymakers can allocate the importance of GOS. Eighth, the community must be empowered, society must be involved to issue a shared responsibility of GOS [17].

According to UNESCO education should be built on four pillars, namely learning to know, learning to do, learning to be, and learning to live together. Based on observations of outdoor games on 20 kindergarten students in 1 semester, the results of language skills and cognitive abilities were obtained by 16% [22]. Games designed to inform or instill certain attitudes, for example, to foster a spirit of togetherness and cooperation, are included in the category of educational games because they provide cognitive and affective learning experiences. Traditional games are also designed not only to prioritize aspects of pleasure but also to have a further meaning both for social development, and children's emotions, so traditional games can be said to be educational games [23].

Quantitative evidence confirmed a positive association between the presence of trails, playgrounds, and specific types of sports fields with GOS visitation and Physical Activity whereas safety and aesthetics seemed subordinate [18]. Control over the children's playground design is based on function as a development area of social life creativity, sense and self-development so that children can have fun, to the playground must meet the following criteria [2]:

1. Ensure the safety, security, and health of the children to play in public spaces.

2. Create comfort and convenience for all children (healthy or with physical and mental limitations).
3. Creating a visual aesthetic and harmony with the character of the surrounding area.
4. Provide clarity about the functions of the game and the strength of the construction equipment.

The criteria can assess the components above include a biotic, abiotic and social system, as follows:

Table 1. Indicators of Child-Friendly

Component	Indicators of Child-Friendly
Biotic	
Flora	Type of plant that is durable, not easy to collapse, non-toxic, shady, given the label to be easily recognizable by children.
Fauna	Local animal species, children are accustomed adjacent and to preserve the animals in GOS, animal manure should be noted, the supervision of the possibility of dangerous animals entering the area of GOS
Human	Regulations enforced, e.g., for the smoking ban, educational waste sorting, etc.
Abiotic	
Landscape	Structuring an edible plant, ramps and not rocky areas, the roads are not tortuous.
Water	Water/ponds can be used for pisciculture education, but around the water, area must be not slippery, GOS can also function as infiltration wells to reduce flooding in locations around.
Air	The GOS location is not too close to the highway, so not excessively interfere with polluting vehicles, the choice of plants that mostly absorb the carbon.
Climate	The selection of plants and water/ponds facilities can retain moisture and reduce heat.
Amenities	Leisure and play's materials that are non-toxic, non-hazardous, smoothly played by children, visually appealing, encourages children to continue learning, and creative activities.
Human-System	
Family	Active parents introduce children to GOS and Outdoor activities.
Community	GOS in an environment should be managed by the community so that the security surveillance easier, and there is an attachment between citizens to maintain the GOS and the children.
Government	Need for programs and interesting activities that can improve educational factor for children to develop motor skills, cognitive, and affective. The game in the form of teamwork or traditional games can be introduced to the children.
Accessibility	Children should easily and safely take the location on foot.

Source: Analysis, 2018

Indicators of the needs of children growth and development by Bloom's Taxonomy concerning the presence of green open space to support a child's education as follows:

Table 2. Children Activity in Green Open Space to Support Child's Education

Indicator	Definition	Linkage to the presence of GOS
COGNITIVE	Includes the ability to restate concepts or principles that have been studied, concerning the ability to think, the competence to acquire knowledge, recognition, understanding, conceptualization, determination, and	

Indicator	Definition	Linkage to the presence of GOS
	reasoning.	
Knowledge	The ability to remember the material. Kids can cite, mention, describe, etc.	GOS can serve as a place for learning for children. Types of activities primarily related to the natural environment such as the introduction of the kinds of plants and how to treat them. Kids can recognize a variety of flora and fauna and efforts should be made to obtain a healthy environment through the movement of waste sorting, etc.
Comprehension	The ability to understand the material, i.e., translation, interpretation, extrapolation. Kids can associate, outlines, outlines, etc.	
Application	The ability to apply the information on the real situation. The child can operate, develop, produce, etc.	
Analysis	Describes a material that is the ability to analyze the elements/parts of matter, identifying relationships, organizational identification. Kids can examine, audit, concluded, testing, etc.	
Synthesis	The ability to produce and combine these elements to form a structure. Kids can display, set up, reconstruct, etc.	
Evaluation	Ability to assess the merits of a case, based on clear criteria. Children can support, choose, decide.	
AFFECTIVE	Dealing with attitudes, values, feelings, emotions, and the degree of acceptance or rejection of an object in learning activities.	
Reception	Ability to receive problems, situations, values, and beliefs passively. Kids can choose, questioning, adhere to, etc.	Kids can work in teams for a science project involving flora and fauna, such as the maintenance of vegetable plants, pisciculture, composting and so that children do the entire management under the supervision of the authorities. Biopore training and socialization sorting of waste can be done in children who subsequently campaigned to all GOS visitors.
Respond	Concerning answer or respond to pleasure or realize something in accordance with the values in the society. Kids can help, ask, compromise, refused, etc.	
Appraisal	Concerning the provision of value, respect, and trust towards a symptom / specific stimulus. Kids can assume, initiate, invite, etc.	
Organization	Covering conceptualization of values into a system of values and priority values. Kids can classify, combine, construct, etc.	
Characteristics	Concerning the integration of all systems of a person and affects personality and behavior. Kids can serve, prove, solve, etc.	
PSYCHOMOTOR	Covering competence to do the job involving the limbs and competencies associated with the physical movement (motor) consisting of reflexes, fundamental movement skills, perceptual ability, accuracy, sophisticated skills, as well as expressive and interperatif	
Imitate	The ability to do something according to the example though not yet understand the meaning of these skills. Kids can clean, reposition, gather, etc.	More physical activity such as exercise routine that divides the children into age groups and types of exercise

Indicator	Definition	Linkage to the presence of GOS
Manipulate	The ability to perform an action and choose what is required of being taught. Children can be refit, mix, identify, etc.	accordingly. In addition to sporting, the traditional game with the teamwork concept can also be done as <i>Oray-orayan</i> , <i>Gobag Sodor</i> , <i>Hide and Seek</i> , <i>Bentengan</i> , etc.
Experience	An appearance of action where it is taught and used as an example has become a habit. Kids can package, operate, rotate, etc.	
Articulation	One can do more complex skills primarily associated with the movement interperatif. Children can be transferred, to form, loosen, etc.	

Source: Krathwohl, 2001. Results of Analysis

Green Open Space is a response to the needs of the public space for children in densely populated areas. In GOS expected that children could have space to grow and develop properly. The children should not find it difficult to reach the GOS, and they must be able to do it alone without the help of parents, this is the accessibility factor is very important considering that most of the GOS in urban Indonesia are still difficult to reach. The location is too far to the settlement and is prone to be achieved by children. The safety factor is also an essential component of both the security on the way to the GOS and security while playing in the GOS. Educational factor is also critical so that children can play and learn with a friendly atmosphere.

4. Conclusion

Green Open Space in urban areas is still mainly under child-friendly standards, the lack of accessibility for children, good security and environmental monitoring equipment, as well as activities that benefit the children growth and development. Good public space is a balanced interaction between the components of biotic, abiotic and human systems to create harmony in urban areas, especially creating pleasant feelings in children causing a sense of attachment to the GOS. Therefore to be considered is the hygiene factor, completion, and maintenance of the facility, the function of green open space as a green area with good infiltration and biopore. As well as activities for children who can meet the needs of growth include cognitive, affective and psychomotor, where the activities of the child must be continuous and under the supervision of the management of GOS, parents, and communities.

Cognitive means the ability to restate concepts or principles that have been studied, concerning the ability to think, the competence to acquire knowledge, recognition, understanding, conceptualization, determination, and reasoning. GOS can serve as a place for learning for children. Types of activities primarily related to the natural environment such as the introduction of the kinds of plants and how to treat them. Kids can recognize a variety of flora and fauna and efforts should be made to obtain a healthy environment through the movement of waste sorting, etc.

Affective relate to attitudes, values, feelings, emotions, and the degree of acceptance or rejection of an object in learning activities. Children can be encouraged to work in teams on a science project involving flora and fauna, such as the maintenance of vegetable plants, pisciculture, composting and so that children do the entire management under the supervision of the authorities. Biopore training and socialization sorting of waste can be done in children who subsequently campaigned all visitors GOS.

Psychomotor includes the competence to do the job involving the limbs and competencies associated with the physical movement (motor) consisting of reflexes, fundamental movement skills, perceptual ability, accuracy, sophisticated skills, as well as expressive and interperatif. More physical activity such as exercise routine that divides the children into age groups and types of exercise

accordingly. In addition to sporting, the traditional game with teamwork concept can also be done as *Oray-orayan, Gobag Sodor, Hide and Seek, Bentengan*, etc.

In the GOS in urban areas has not met most of the child-friendly facilities and activities that support the development of the child, also, the sports facilities are very limited. The urban GOS needs to be more comprehensive management of both physical and non-physical components.

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