

Conference Paper

Multifunction Green Open Space for Environmental Education

Riyawati Ika Dewi¹, Ahman Sya², and Diana Vivanti²¹Environmental Management Program, State University of Jakarta²Lecture of Environmental Management Program, State University of Jakarta

Abstract

With huge pressures from a rapidly growing population, Jakarta suffers from an increasingly low Environmental Quality Index (IKLH). In 2016 and 2017 it was the only province in Indonesia with the IKLH index “alert” according to the Ministry of Environmental and Forestry. Improving the quantity and quality of Green Open Space (GOS) is one way to counter this issue, and this initiative is undertaken by the DKI Jakarta Government to improve the quality of its environment. However, land limitations remain a challenge. The solution of the DKI Jakarta Government is to create multifunction GOS that combine various interests and facilities. The purpose of this study is to identify potential educational benefits from multifunction GOS, using qualitative analysis via literature study. The results suggest that the GOS provide economic, social and educational improvements. Most of the articles said that education through GOS is the second benefit that people can get. This study concludes that GOS can serve to improve environmental awareness in visitors, via indirect educational methods.

Corresponding Author:

Riyawati Ika Dewi

riyawati.ikadewi@gmail.com

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1. Introduction

By a prediction in 2030, Indonesia will get a demographic dividend. Demographic dividend is an economic benefit caused by a decrease in the dependency ratio as a result of a decrease in long-term fertility [1]. The demographic dividend that occurs in Indonesia also impacts the demographic dividend in Jakarta as the capital city of Indonesia. The total population of Jakarta in 2018 is 10,467,600 people and it is predicted that by the end of 2019 it will be 10,577,800 people [2]. This population increase does not make Jakarta Capital City's area increase, so it has an impact on the city's growth process. While population growth is followed by increasing of ecological, economic and social needs.

Along with the increase in population, there will be an increase in the utilization of natural resources. The Government of DKI Jakarta always carries out urban development

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activities to meet the needs of its people. Urban development is carried out massively in various sectors without being realized that dredging of natural resources has resulted in the degradation of environmental quality. Based on the Environmental Quality Index (IKLH) data published by the Ministry of Environment and Forestry in 2017, IKLH of DKI Jakarta in 2016 was 38.69 [3] and in 2017 it was 35.78 [4] and as the only province in Indonesia with the IKLH category “ alert “(standard alert category is $30 \leq \text{IKLH} \leq 40$). The physical development of the city to support the facilities and infrastructure of the city’s needs is carried out by the Government of DKI Jakarta, which finally forgets the need of land for Green Open Space (GOS). Through GOS can maintain the ecosystem. Realizing this, DKI Jakarta Government has a regional regulation (Peraturan Daerah) DKI Jakarta No. 1 year 2012 about Spatial Planning and Regional Planning (RTRW) as outline for city development, which is required to provide GOS as much as 30% of the total land area of DKI Jakarta Province. The Sustainable Development Goals (SDG’s) became a shared ideal agreed by countries in the world that contained 17 goals with 169 measurable achievements and by the United Nations as the world agenda for sustainable development for the good of humanity and planet earth on October 21, 2015 as ambitions to be achieved in 2030, is one of the ambition of DKI Jakarta Province also. How to provide continues city development without forget next generation as our grandchild? GOS seems the answer of the question. But how develop GOS with minimal area inDKI Jakarta Province ?

GOS, is the application of number 3 (good health and well being) and number 15 (life on land) SDG’s. In its effort to provide this GOS, the Government of DKI Jakarta has always tried to meet the needs of its people for other aspects, namely economic, ecological and social aspects. GOS according to the Regional Regulation (Peraturan Daerah) of DKI Jakarta no. 1 of 2012 is an elongated area / lane and / or group that is used more open, a place to grow plants naturally or planted. As an elaboration of the spirit of the DKI Jakarta Government to provide its community/citizen needs in a balanced and healthy manner and healthy environment, a Medium-Term Regional Development Program (RPJMD) was published as outlined in Regional Regulation (Peraturan daerah) No. 1 of 2018, one of Program is a “Kota Lestari” program. The program contains 4 components, they are (1) Improvement of the quality of Green Park Open Space (2) Optimization of Park Green Open Space (3) Revitalization of Park Green Open Space (4) Increasing public awareness to maintain Park Green Open Space.

Park revitalization carried out by the DKI Jakarta Government is designed as a multi-function green open space. In accordance with the mandate of the Minister of Public Works Regulation No. 05 / PRT / M / 2008 concerning Guidelines for Provision and

Utilization of Green Open Space in Urban Areas, there are 4 functions, namely (1) social and cultural (extrensic) functions, (2) aesthetic functions, (3) economic functions and (4) ecological functions [6].

Not to be separated from it all, the aspirations of the community as consumers of visitors to green space should also be assessed satisfaction. Customer satisfaction is a match between the benefits sought by customers and the satisfaction provided by producers [5]. It is expected that with the satisfaction of the community for the facilities built and provided by the government will create a sense of sustainable ownership. Explanation about GOS, Regulation of Minister of Public Works (Menteri Pekerjaan Umum) No. 05 / PRT / M / 2008 concerning Guidelines for Provision and Utilization of Green Open Space in Urban Areas explains that the benefits of green space based on its function are divided into: (1) direct benefits, concept as beauty, comfort and get raw materials for comodity and (2) indirect benefits as air purifiers which are very effective, maintenance of the continuity of ground water, preservation of environmental functions and all their contents [6]

The Government of DKI Jakarta has two concepts of developing multifunction of GOS, the period 2014-2017 was named Child Friendly Integrated Public Space (RPTRA) and Taman Maju Bersama (2017 till now).

FGD (Focus Discussion Group) presented by the Deputy Governor of DKI Jakarta in the field of Spatial Planning and the Environment on August 18, 2017 was held to know the level of community satisfaction as customer users and visitors in the RPTRA in the 2016-2017 period [7] are shown in Figure 1.






PARAMETER		MAY-DEC		JAN-JUNE	
No	PARAMETER	COLOUR PARAMETER	2016	2017	
1	VERY SATISFIED		62%	59.53%	
2	SATISFIED		36%	39.46%	
3	LESS SATISFIED		1.6%	0.68%	
4	POOR		0.3%	0.18%	
5	VERY POOR		0.1%	0.15%	
LEVEL OF SATISFACTION			98%	98.99%	

Figure 1: Level of Satisfaction of Community Visitors RPTRA Period 2016-2017

The concept of Taman Maju Bersama that represented by DKI Jakarta is to accommodate 3 interests, they are government interest as the party who must preserve the environment and service providers to the community, the community as the customer and the environment itself as a counterweight to nature.

Mr. Sandiaga Uno, as the deputy governor of DKI Jakarta on April 9, 2018 explained, “The basic difference is that this park together will collectively accommodate the wishes of citizens to participate, starting from planning, procurement, utilization to future management” [8]

The concept of development of each Taman Maju Bersama location is different, the similarity is the proportional green space must be 90%. Accommodating the wishes of the community is expected to increase the effectiveness of community visits to green space so that it has an impact on improving the health of the community itself and the sustainability of the presence of GOS because of its functions that are in accordance with the wishes of the community. GOS combined with a variety of functions is the answer to the lack of land in DKI Jakarta to maintain environmental sustainability and the needs of the people of DKI Jakarta

Testimony of students as part of the community over the multifunction GOS in DKI Jakarta to develop environmental education was also raised during a hearing between representatives of the DPR members Mr. Masinton Pasaribu and Mrs. Irma Suryani with Postgraduate Masters in Biology at the National University on November 26, 2016, that one participant named Ahmad Baihaqi explained that in beside as a city aesthetic, GOS DKI Jakarta also plays a role for biodiversity that lives in the Capital that can be used for environmental education for school children and researchers who want to find out more about existing biodiversity [9]

The DKI Jakarta Government does not stop there, the development of GOS function is still carried out to meet the expectations of the people of DKI Jakarta. GOS that can be used for a variety of beneficial purposes can also be called a green space multipurpose. Starting with the concept of multi-purpose green space called the Child Friendly Public Open Space (RPTRA) which was then continued is “Taman Maju Bersama TMB)” is one of the solutions provided by the DKI Jakarta Government today. Examples of added value expected are the existence of environmental education for children and social interaction between citizens as an additional social aspect and an additional income of the surrounding community as an additional economic aspect..

2. Methods and Equipment

In this study, researchers used a qualitative method with a literature study approach by examining the relevance of several theories and journals that relating to problems in research. Retrieval of data by studying books and documents related to research referred to as the study of literature [10]

First for this review, we identify several papers through Scopus, Web of Science, Education research that was searched from internet around August 2019 using keyword green open space, environmental education, multifunction of green open space and other related keyword. We choose this related keyword because it could show peer-reviewed journals in any discipline that have studied how the provision of GOS to environmental education. We also review the references from books and references list of articles and screened additional potentially relevant studies

Second, both authors reviewed independently reviewed titles, abstract and full text about the article eligibility, for conclusion of this article

3. Results

This research will describe some of the results of research that has been done related to multifunction GOS, they are:

1. GOS can be as facilities that can be used for activities, including city parks, cemetery parks, sports fields, urban forests and others that require green facilities, namely green lines along roads, river borders, railroad tracks, and below high voltage line. [11]
2. A study in 2014 with Parahiyangan University Post-graduate student in respondents who had visited a public GOS showed that the expected main functions of GOS and supporting facilities of GOS in urban areas were shown in Figure 2 and 3 [12]
3. Research title 'Managing multifunctionality in Urban Open Space Approaches for Sustainable Development' by Wenzheng Shi, 2014 explain that maintaining well-being of citizen while also achieving sustainable environments by its town must be engaged in effective landscape management to improve its green infrastructure, green infrastructure work should be adapted to the understanding and implementation of managers. Multifunctionality of Urban Green Space impacts people, communities and quality of life through their value for people in terms of aesthetics, education and the amelioration of negative aspects of urban life, such as noise reduction [13]
4. Research title 'The role of open space in urban neighborhood for health-related lifestyle' explain that poor quality and the lack of open green areas lead to poor form of spatial uses and consequently to less healthy life style. There are linkage between the concept of open green area as spatial determinants of health (phase

- 1), behavioural determinants of health (phase 2) and perceptual determinants of health (phase 3). Perceptual determinants of health (phase 3) are indirect and effect the behavior pattern and style occupant (people who visit and live around) in physical activity, health self - evaluation and satisfaction with living environment [14]
5. Research title 'Environmental education excursions and proximity to urban green space-densification in a compact city by Maarteen Wolsink stated if the approach of a field trip to the proximity of GOS is very important to shape the outdoor pattern of environmental education. After the pattern is formed, it is expected to form a new teacher educator pattern. Unfortunately in addition to the effects of GOS for good life and health, the function of GOS as environmental education is still limited [15]
6. The existence of other functions of GOS is also raised by James Sinurat where Green Open Space is not only for the environment to increase economic activity so that there is an increase in the value of the gross regional domestic product (PDRB) [16]
7. Based on 2018 study entitled Strategic Role of Child Friendly Integrated Public Spaces in the Context of Fulfilling Children's Rights to the Environment, explained if the RPTRA's function of fulfilling children's rights to the environment had been fulfilled because the facilities in the location could fully accommodate the possibility of children to play, recreation, participation and freedom of assembly, learning with the environment, and in general the satisfaction of RPTRA visitors has been satisfied [17]
8. Other research explain that children as visitors feel the emotion attractive to the RPTRA, one of which is due to the availability of the physical dimensions of the RPTRA for learning facilities and conducting educational structured activities [18]
9. Yuniastuti and Hasibuan, (2018) explained that GOS is able to provide environmental education for children where there is an interaction between nature systems: biotic (plants and animals), abiotic (water and environment) and human systems (children, people adult) but facilities built in DKI Jakarta GOS are still not suitable for education for children in terms of the ease of access facilities for children, the safety and comfort of the environment that do not yet support child development [19]

10. Other research explains the existence of multifunction GOS be able to built social interaction for children (ages 6-12 years) which possible for indirect love education towards the environment where children can play games traditionally so can build a sense of solving problems more wisely [20]
11. Browning, M and Rigolon, A (2019) had final research that tree cover near school, green windows view, college preparatory exams and end-of- seminar grades are most promising indicator that can be search as beneficial link between green space and academic performance. It is reviewed that green space and academic performance are connected [21]

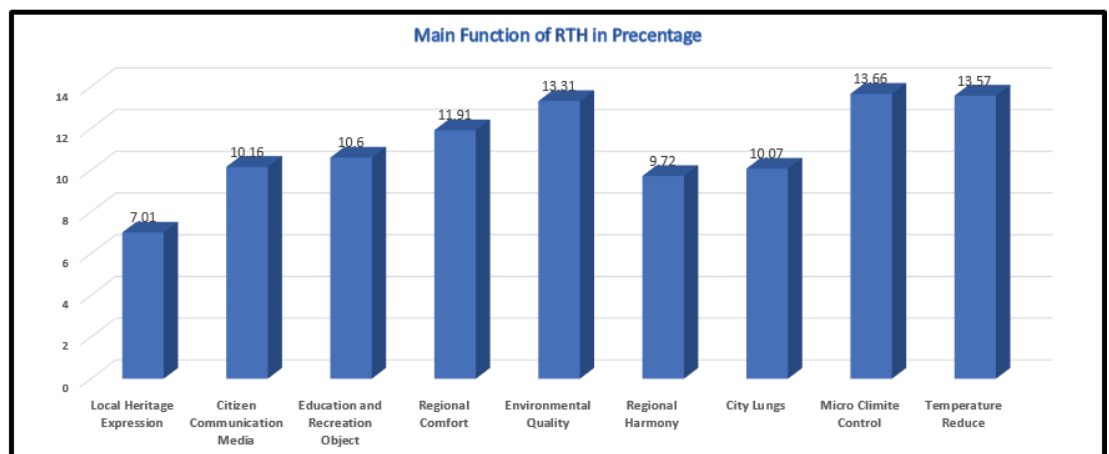


Figure 2: Main Function of Green Open Space

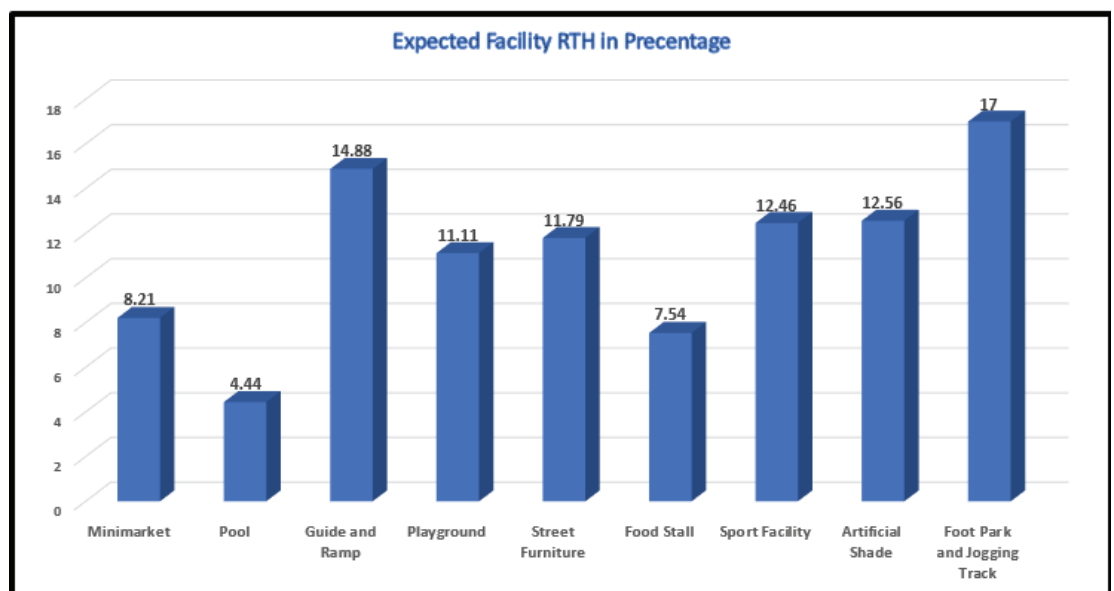


Figure 3: Expected facility of Green Open Space

4. Discussion

In the introduction research question were formulated: What is the advantage by giving some areas to be planted by trees specially in limited area such as DKI Jakarta? and is there advantage for education ? With the result of the study, we can formulated to answer the question.

Now days open space is less for humans. Increasing population without being followed by control is one of the main problem. This is increasingly felt crowded for people of Jakarta who live in the national capital. On the other hand, health and education must be priorities that must be considered to create a better future generation, in the same time infrastructure development to support economic activities must continue. Many brilliant overview/thought, to make economic sustainability with the preservation of green open space.

Research above explains if the benefits of green space are very large and it is very possible to be integrated with various interests and needs. Without green open spaces that remain and are maintained, health and education will decline in quality. People of Jakarta is the community of customer government of province DKI Jakarta. It is expected that customer satisfaction is highly priority. Existing condition which is lack of GOS make the DKI Jakarta government have to modify the function of the GOS they have. Environmental education that fosters children's love for the environment, social care among people is the most expected to grow by visiting a multifunction of GOS, in addition to adding benefits in other sectors. It is hoped that the love of the community for the environment will ease the workload of the government due to the high participation of the people because of environmental concerns.

Sustainable management of GOS is one way to provide answers to the needs of people Jakarta. Integrating green open space functions with various functions based on the needs of people Jakarta is one of the answers given by the Jakarta government. Multifunction green open space is the answer and Taman Maju Bersama is the solution currently provided by the DKI Jakarta Government. The concept of participatory-collaborative city 4.0 where the community is involved as creators for the green space concept is expected to be contributed from the Taman Maju Bersama concept. One example of Taman Maju Bersama that has been built is Taman Maju Bersama Skatepark Slipi Slipover and Taman Maju Bersama Taman Kalimalang Picnic.

Final result from the research above, the desire of the community (in general) for GOS is to improve the quality of the environment, microclimate regulator, regional comfort,

shade, education and recreation as well as citizens' communication media and as a way to improve the economy.

GOS that is integrated with educational activities, provides another value, more than just to have healthy air. The concept of GOS greatly influences people who visit, so the multi function GOS combined with education will provide new education for people who visit. Fulfillment of children's rights, emotional attachment among children, teenagers and parents, interaction among children, teenagers and parents with an abiotic and biotic environmental, preservation of traditional games that have noble values are some of the things as the result of the above researches. Closeness and interaction between visitors and GOS is expected to ultimately provide a good pattern of environmental education for the teacher or students.

Thus, in the era of the Industrial Revolution 4.0, the development of green open space requires contributions from surrounding communities related to concepts, infrastructure facilities and facilities that were created to suit the needs of the people who use them. One thing that should not be left out is as a means to provide environmental education for children because education from an early age will create and shape identity in the future

5. Conclusion

The green open space created by the DKI Jakarta government is one way to address environmental, social and economic problems. Multifunction GOS is the solution to created over all components so that the various problems surrounding Jakarta can be resolved gradually and together. Environmental education is expected to be one of the second benefits that can be generated from this multi-purpose green space, in addition to the main benefit is to provide improved environmental quality. It is expected that environmental education that children and adults unnoticed as GOS visitors who directly interact with the abiotic and biotic environment can create intelligent humans who are aware of the environment

Increasing the quantity and quality of GOS is a challenge for the Government of DKI Jakarta to provide appropriate services for citizens of the DKI Jakarta community, especially in the environmental field. Promoting the love of the environment so that a balance arises between environmental sustainability and development carried out to be the next challenge so that the goal of creating a "Jakarta Sustainable City" can be effectively realized.

All of these things done by the Government of DKI Jakarta have a very big final goal which is to provide a balance between the use of natural resources and the preservation of natural resources for sustainable living in accordance with the spirit of SDG's

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Conflict of Interest

The authors have no conflict of interest to declare.

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