

# Green space open analysis (RTH) in State Polytechnic of Malang

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**Abstract.** The increasing number of students, lecturers and staff brings consequences for Politeknik Negeri Malang to improve the facilities and infrastructure. The consequences of the development will impact on the reduction in green open space. The use of green space must be adjusted as a means of supporting education. Based on the identification of several locations that have the potential to be optimized for use through the additional function of green space as public spaces and open study spaces.

## 1. Introduction

State Polytechnic of Malang is one of the largest Indonesian vocational school located in Malang city. When it was founded in 1982, State Polytechnic of Malang had four departments, namely: Electrical Engineering, Electrical Engineering, Mechanical Engineering, and Civil Engineering. Along with the development of industry and national development in Indonesia, in 1986 the Department of Telecommunications Engineering, the Department of Accounting, and the Secretariat Department was opened. The following year, in 1987 the Chemical Engineering Department was opened. At present there are 23 Study Programs in the State Polytechnic of Malang. The increasing number of study programs will also have an impact on the number of students, lecturers and staff, so that State Polytechnics of Malang also have to increase the number of existing facilities and infrastructure. The consequences of the development will impact on the reduction in green open space.

Green open spaces are elongated areas / pathways and / or groups that are open in use, where plants grow, both natural and intentionally planted [1]. Green open space in an area serves to balance the ecological situation in order to create a balance between ecosystems and developmental development. Green open space is part of an open space filled with plants and vegetation in order to get the benefits of safety, comfort, prosperity, and beauty of an area [2].

Referring to the ideal criteria for providing green open space regulated in UU No 26 of 2007, it is stated that the proportion of green open space in an urban area is 30% of the area [3]. The proportion consists of 20% public green open space and 10% private green open space. Whereas the utilization of green open space can be reviewed based on its function namely intrinsic function (ecological function) and extrinsic function which includes socio-cultural, economic, and aesthetic functions.

Green Open Space (RTH) is part of open spaces in the spatial planning of an urban area filled with plants and vegetation (endemic, introduction) to support the direct and/or indirect benefits generated by RTH in the city is safety, comfort, prosperity, and beauty of urban areas [1]. The provision and the



utilization of urban green open space, the use of green open space can refer to additional functions (extra), namely as a social and cultural, economic, and aesthetic function.

This study aims to examine the provision of green space at Polinema campus so as to create a comfortable, clean, and healthy campus for its inhabitants. The utilization of green open space is adjusted as a means of supporting education.

According to UU No 26 of 2007 concerning Spatial Planning, the types of Green Open Spaces are as follows:

- RTH Public  
Public green open space is a green open space that is owned and managed by the regional government that is used for the benefit of society in general. Public green open spaces include: City parks, public cemetery parks, green paths along rivers, roads and beaches.
- RTH Private  
Private green open spaces include the garden or the yard of a houses/buildings owned by the public or private planted with plants.

According to Permendagri No.1 of 2007, based on the location of green open space can be divided into:

- a. Green open space is developed in accordance with the urban space allocation areas:
  - High density residential area.
  - Medium density residential area.
  - Low density residential areas.
  - Industry area.
  - Office area.
  - College / college campus area.
  - Trade area.
  - Roadway area.
  - River strip area.
  - Coastal strip area and utility area.
- b. In landscapes with various landforms according to slope conditions and elevations above sea level and their position with respect to river channels, roadways, and utility safety lanes.
- c. On the land in urban area which controlled by a legal entity or individual that has not been used or abandoned.

According to the Minister of Home Affairs Regulation No. 1 of 2007 Regarding the Arrangement of Green Open Spaces in Urban Areas, the purposes of the formation of green open spaces are [4]:

- Maintain the harmony and the balance of the urban environmental ecosystem;
- Creating a balance between the natural environment and the artificial environment in urban areas, and;
- Improving the quality of a healthy, beautiful, clean, and comfortable environment in urban areas.

Whereas according to Permen PU No. 5 of 2008 the purposes of conducting green open space are:

- Creating urban planological aspects through a balance between the natural environment and the built environment that is useful for community interests.
- Improving the harmony of the urban environment to protect the comfortable, fresh, beautiful, and clean urban environmental safety facilities.

### *1.1. The benefits of green open space*

According to the Minister of Home Affairs Regulation No. 1 of 2007 concerning the Arrangement of Green Open Spaces in Urban Areas the benefits of open space are as follows:

- Providing freshness, comfort, and beauty of the environment.
- Provide a clean and healthy environment for citizen.
- Providing results in the form of wood products, leaves, flowers, and fruit.

According to Permen PU No. 5/PRT/M, 2008 Regarding Guidelines for Provision and Utilization of green open space in urban areas, the benefits of green space based on its function are divided into direct benefits (in the quick and tangible sense) such as getting materials for sale (wood, leaves, and flowers), physical comfort (shady and fresh), indirect desires and benefits (long-term and tangible) such as protection of water systems and biological conservation or biodiversity.

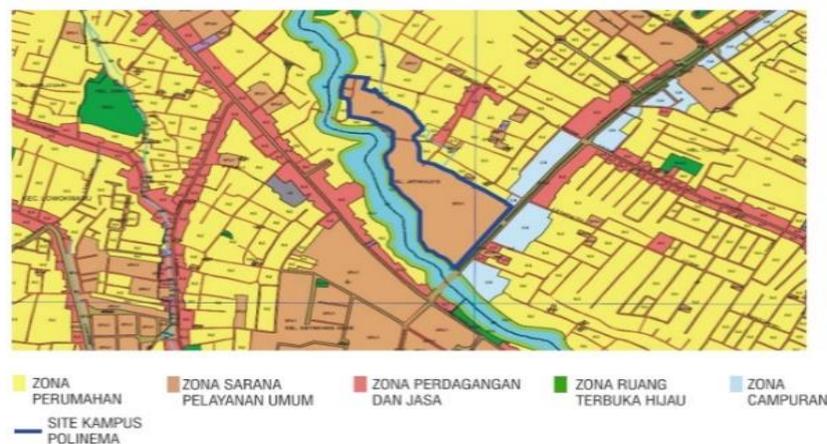
Open learning space or the classroom (outside) in modern concepts is a meeting place that offers an area to facilitate and accommodate the students in carrying out discussion sessions in a quiet and comfort place. Open learning space can be an ideal place to mingle, face to face with virtual meetings, which allows all students to join in project discussions [5]. The availability of a conducive, calm, healthy physical and mental environment will support the results of learning activities greatly.

## 2. Methodology

This research uses a qualitative approach with descriptive methods. The data used are primary data and secondary data. Primary data were obtained from observations and interviews at the Polinema campus to determine the provision and utilization of campus green space. While secondary data were sourced from documents regarding the Polinema Campus Activity Environmental Permit.

## 3. Discussion

Polinema campus complex is in the North Malang area surrounded by a residential zone and commercial area. Politeknik Negeri Malang is located in the center of Malang, which has  $\pm 13.8$  ha of land.



**Figure 1.** Zoning area around State Polytechnic of Malang.

At present, Polinema campus has 6.6 of building area. Based on these data, Polinema has a green open space 52% of the total land area. Therefore, the Polinema campus physically meets the minimum requirements for green space that exceeds the rules.

According to Permen PU No. 5 of 2008 the provision and utilization of green space can be reviewed based on the area and location of potential land, structures, and patterns that might be developed, as well as vegetation criteria that are in line with their development interests. In order to find out the location and the potential area of green space, it can be reviewed based on the basic function of providing and utilizing green space, namely as an ecological function, social and cultural function, economic function, and architectural/aesthetic function. Therefore, it is expected that the provision and utilization of green space area in campus will be able to stimulate the creativity and productivity of campus residents and can create a 'balance of physical and psychological life'. Based on this, the fulfillment of the green space area basic functions can be a measure of the success of the provision and utilization of high-performance campus green space area in Polinema.

Based on location the field survey's results that have been carried out around the Polinema Campus, there are several green open area locations scattered in several campus areas, both centralized and located around the lecture building area.



Source: Documentation.

**Figure 2.** Green open space in front of the head office.

Based on the observations at these locations there are trees that can function as aesthetics and also producing O<sub>2</sub>.



**Figure 3.** Green open space in Raya Annur Mosque area.

Based on the observations at these locations there are trees which can function as public areas and open study spaces that can support student activities.



**Figure 4.** Green open space at AX Building.



**Figure 5.** Green open space at Water Reservoir.

Based on the observations at water reservoir's area, there are trees that can function as public areas and open study spaces that can support student activities by adding various facilities such as gazebos, garden lights, electricity networks, and also the internet connection.



**Figure 6.** Green open space at Electrical Engineering building's area.



**Figure 7.** Green open space at AP building's area.

Based on the observations, Green public area in the AP building can be used as public openness to support student activities.

**Table 1.** The identification of the location utilization for green open space on Polinema campus.

No	Location	Potential Type (Green Open Area Function)
1	Raya Annur Mosque	Socio-Culture (Public Spaces and Open Learning Spaces)
2	Chemical Engineering Building	Socio-Culture (Public Spaces and Open Learning Spaces)
3	The front field of Electrical Engineering	Socio-Culture (Public Spaces and Open Learning Spaces)
4	The park in Electrical Engineering area	Socio-Culture (Public Spaces and Open Learning Spaces)
5	The field of head office building	Aesthetics ( <i>Campus icon</i> )
6	The park near Graha Polinema	Aesthetics, Socio-Culture (Public Spaces and Open Learning Spaces)
7	The park of Trade Administration Building	Socio-Culture (Public Spaces and Open Learning Spaces)
8	The park of Accounting Building	Socio-Culture (Public Spaces and Open Learning Spaces)
9	The park of Annur Mosque Building	Socio-Culture (Public Spaces and Open Learning Spaces)
10	The park of Water Reservoir Building	Socio-Culture (Public Spaces and Open Learning Spaces)
11	The park of Electrical Engineering Building	Socio-Culture (Public Spaces and Open Learning Spaces)
12	Telkom Park	Socio-Culture (Public Spaces and Open Learning Spaces)
13	Green open area of Civil Engineering Building	Socio-Culture (Public Spaces and Open Learning Spaces)

Source: Survey's Results.

#### 4. Conclusion

- Based on the identification results of the potential use of green space on Polinema campus there are several locations that have the potential to be optimized for use through additional green space functions.
- The use of green space in the Polinema Campus area can be used as a socio-cultural function to accommodate a variety of campus community activities so that it can be used as a public space and open learning space to carry out learning activities outside the classroom.

#### Reference

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- [5] EDUCAUSE Learning Initiative 2011 *Seeking evidence of impact* Retrieved from <http://www.educause.edu/ELI/SEI>