



## Depok Eco-Friendly Library as an Educational Tourism Destination

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### Abstract

**Purpose:** This study is to design a library in Depok City in West Java, Indonesia, which is a Central Government which is adjacent to Jakarta (the nation's Capital) as well as to be able to support the City of Depok as an education city, and infiltration area.

**Research methods:** It uses a descriptive method and divides into three stages: (1) data exploration by collecting related data and existing site conditions, (2) site and building analysis, (3) building design and making 3d model's design.

**Findings:** Understanding of surrounding conditions will be very helpful in designing eco-friendly building. Like wise with the building and site design that adapts to local environmental conditions will also provide comfort for the users themselves and even the surrounding residents.

**Implications:** Creating an environmentally friendly library design by implementing the library tourism attractiveness index system will certainly make people interested in visiting continuously and getting positive benefits. The local and wider community not only gain knowledge but also freshness and happiness.

**Keywords:** eco-friendly library, design, architecture, educational tourism.

### INTRODUCTION

The earth has its limits and building needs to be environmentally friendly as well as handsome and cost efficient. Therefore, sustainable design will become more important as a design element as its value becomes more widely accepted (Sanwald, 2006). Sustainability can be seen as the continued ability of a society, an eco-system or any such interactive system to function without exhausting key resources and without adversely affecting the environment (Udomiaye, 2018). The categories that characterize eco-friendly architecture can be defined as follows: (1) Merging architecture in landscape, (2) Combination or link of the object with the garden space or the environment, (3) Use of nature symbolism to create relations between architecture and its cultural context, (4) Environmental technology studies which create an ecologically responsible and sustainable architecture basis, (5) Environmental design and construction techniques that support the acceptance of the new "green architecture" and integrating objects in the context, (6) Longsighted architectural and urban planning ideas which give an imagination of the future, based on general social and political changes which may influence construction art and environmental policy, etc (Kajtazi, 2009). To accommodate the different environmental conditions and regional regulations, the development of each city requires

analysis for an eco-friendly architecture approach, as well as the design of the library.

Library is a collection of resource in a variety of format that is (1) organized by information professionals or experts who (2) provide convenient physical, digital, bibliographic, or intellectual access and (3) offer targeted services and programs (4) with the mission of educating, informing, or entertaining a variety of audiences (5) and the goal of stimulating individual learning and advancing society as a whole (American Library Association, 2010). As well as libraries are playing an increasing role in tourism service, which is identified as “Library + Tourism” trend. Natural attraction, humanistic attraction, social attraction, and service attraction are the core elements of the “Library Tourism Attraction Index System” (Yang Li, 2019). This is the basis of this study to provide recommendations for a suitable library design located in Depok with an eco-friendly architecture approach and to support the city of Depok as buffer city for the nation’s Capital, some of which are as a city of education, tourism city, and infiltration area (Depok City Government, 2019).

## RESEARCH METHODS

This study uses a descriptive method and divides into three stages. First, data exploration by collecting related data such as books, journal, previous research, and website article in relation to the topic; and measurement of the project location, regulatory data from the government, and existing site conditions. Second, analysing the site and building project to implement eco-friendly architecture. The last stage is designing the library building and making 3D models.

## FINDINGS

Based on natural attraction in the index system of library tourism attraction (Yang Li, 2019): (1) The building environment of the library mainly includes its location and surrounding environment, which play an obvious role in exchanging the attractiveness of library tourism; (2) The architectural appearance of the library has also been a focus of attention in the design library buildings in recent years. An ingenious design that conforms to the functions of the library can attract the attention of the media and the public; (3) With the increase in people’s requirements, public requirements for the space environment in the library are also getting hinger and hinger.

### **Merging Architecture in Landscape**

As an infiltration area, Depok has several regulations that must be considered in the design of the building and the arrangement of the site: Building Basic Coefficient (KDB), Building Area Coefficient/KLB, Setback Area/GSB, The Green Area Coefficient/KDH. Accordingly, the site has a large number of open spaces and green areas that can be used for infiltration areas and building temperature conditioning. In addition, these areas can be used as a reading garden, semi-outdoor reading area, and a place to rest while enjoying the surrounding scenery.



Figure 1. Open space areas  
[Source: Ilham, 2021]

The building environment of the library mainly includes its location and surrounding environment, which play an obvious role in enhancing the attractiveness of library tourism (Yang Li, 2019). As of the placement of the green area in the middle of the building and garden with a unique circulation, the pattern is intended as a special attraction for the library.



Figure 2. Indoor green areas  
[Source: Ilham, 2021]

The site is divided into 4 areas: green zone, public zone, semi-public zone, and service zone. Determination of site zoning is based on several considerations, including: (1) Existing topography and vegetation, in order to minimize changes in natural conditions. The contour site is declivous with a height difference around 1-2 meters and the highest contour in the western area. These

conditions are taken into consideration for direction of wastewater movement and the determining the location of the liquid waste filtration, as well as the green area; (2) User behavior patterns in the site and building areas. The function of the building is a library for all ages, which can come alone, in groups, or with family. Consequently, the circulation pattern and spatial layout of the area and building are made as comfortable and safe as possible. (3) The site boundaries, such as main roads, supporting roads, and the surrounding environment. These are also to consider the noise level and easy accessibility for determining the orientation of the building and the main entrance.

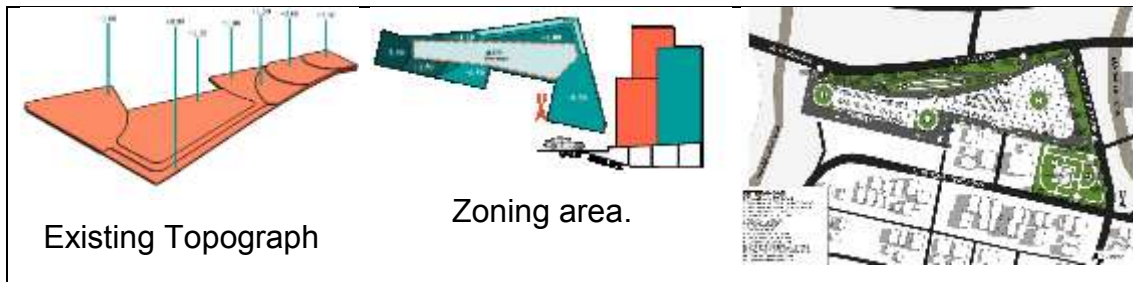


Figure 3. Existing and Site Analysis  
[Source: Ilham, 2021]

### Responding to the Environment

The dominate wind direction from the north to the south of the side. Beside having a positive impact, it also can bring the noise to the northern region. Accordingly, the building is directed backwards away from the main road and provides greenery to minimize noise entering the building. The greenery area is also designated as a groundwater absorption, reading garden, a relaxing area, and a place for sculpture. There is a roof garden on the left building as a solution to reduce heat gain and building efficiency energy. The outside view to the building and the inside view to the outside of the building are taken into consideration in site zoning and building plans. In addition, the best view is towards the north because it faces the green area of the city and the main road.

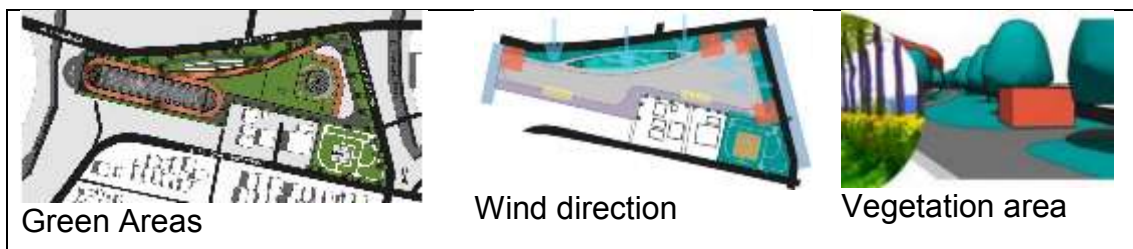


Figure 4. Wind Site Analysis  
[Source: Ilham, 2021]

The solar radiation factor in Indonesia is quite high because it is located at the equator. Solar Factor (SF) based on the calculation of SF in Jakarta from Ministry of Public Works (Depok is borderer by Jakarta) in the western part of 243 w/m<sup>2</sup> and 130 w/m<sup>2</sup> in the north, while in the eastern part it is 112 w/m<sup>2</sup> and the lowest in the south is around 97 w/m<sup>2</sup>. Site temperature measurement in November 2020: (1) at 07.00-10.00: 26°C - 30°C; (2) Time: 13.00 - 16.00: 33°C-36°C; (3) Time: 19.00-21.00: 26°C-30°C. Consequently, the windows of the west



side of the building are minimized. Whereas the east and south sides of the building are provided with a canopy and a secondary skin with bamboo material to avoid excessive sunlight and the heat from entering the building.

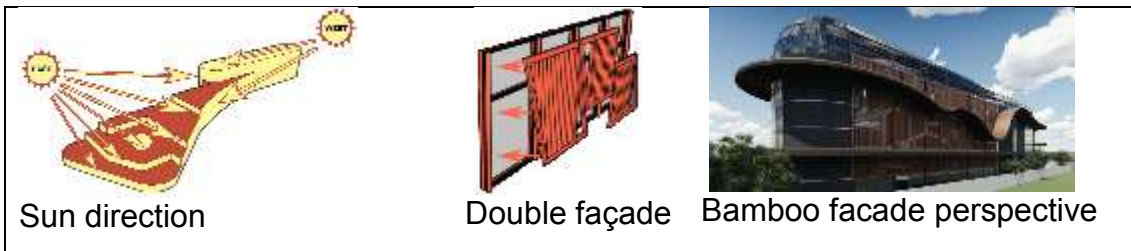


Figure 5. Solar Factor Analysis  
[Source: Ilham, 2021]

As well Rainfall conditions in Depok are generally between 2684 mm/year and number of rainy days 222 day/year between October and March, with temperature of 24,3°C-33°C and humidity of 82 % (Bappeda Depok, 2017). This greatly affects the design of the building, especially in roof shape. Therefore, the roof of the building is convex, and the library canopy is formed with a curved shape to provide easy flow of rainwater down and does not impose an excessive rainwater load on the roof.

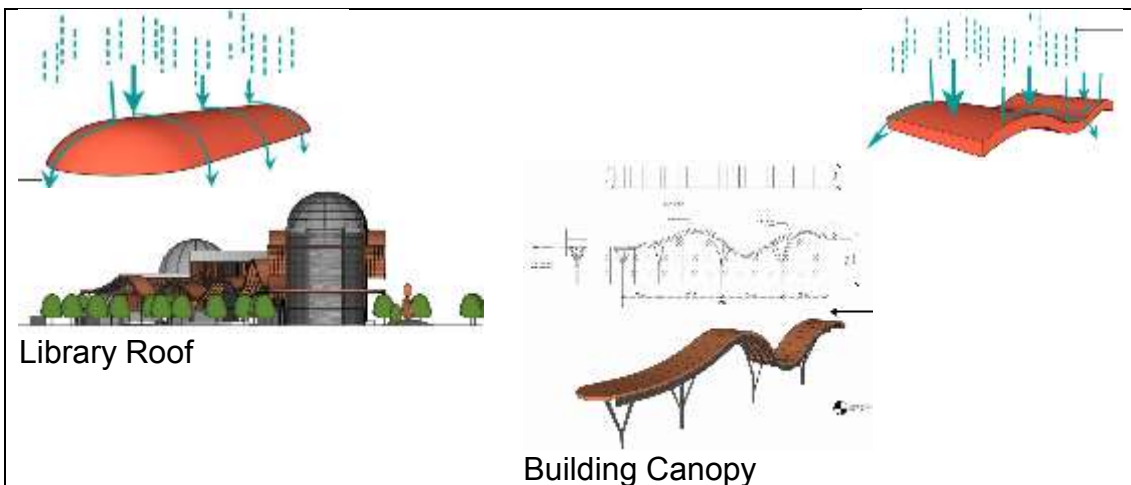


Figure 6. Rainfall Analysis  
[Source: Ilham, 2021]

Height-low elevation of the building as a consideration of the movement of airflow in the area and to be able to circulate air more evenly into the inner building, as well as minimize air circulation disturbance in the surrounding area which has a lower elevation.

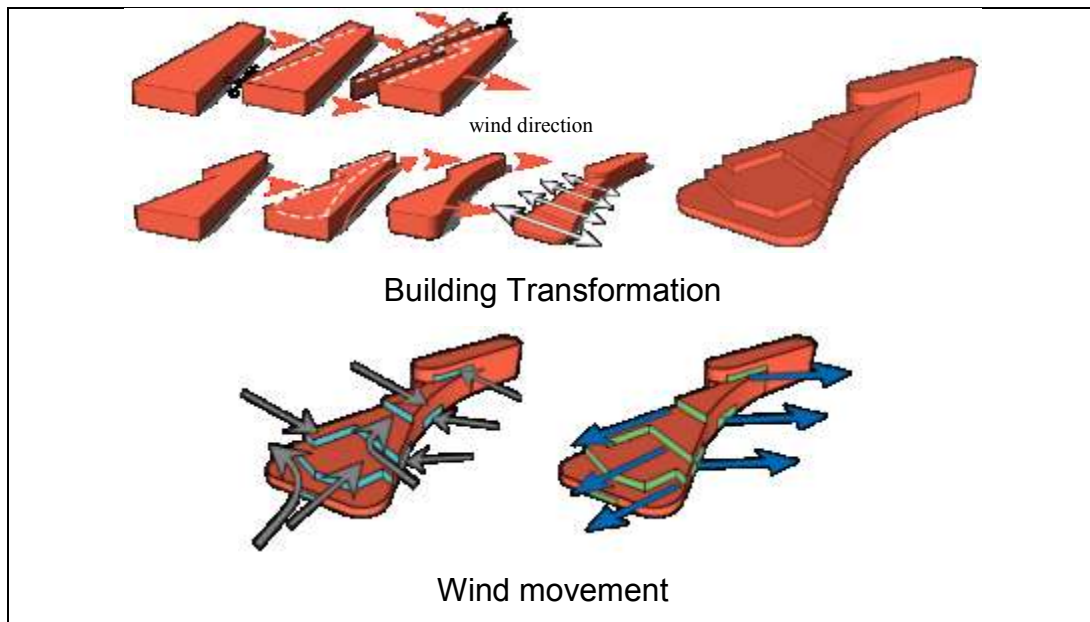


Figure 7. Building Mass Analysis  
[Source: Ilham, 2021]

### Historical and Cultural Library

As a symbol of culture, the form of the library combines local wisdom with current building technology: (1) the curve shape dominates the building, which is an aerodynamic building form;

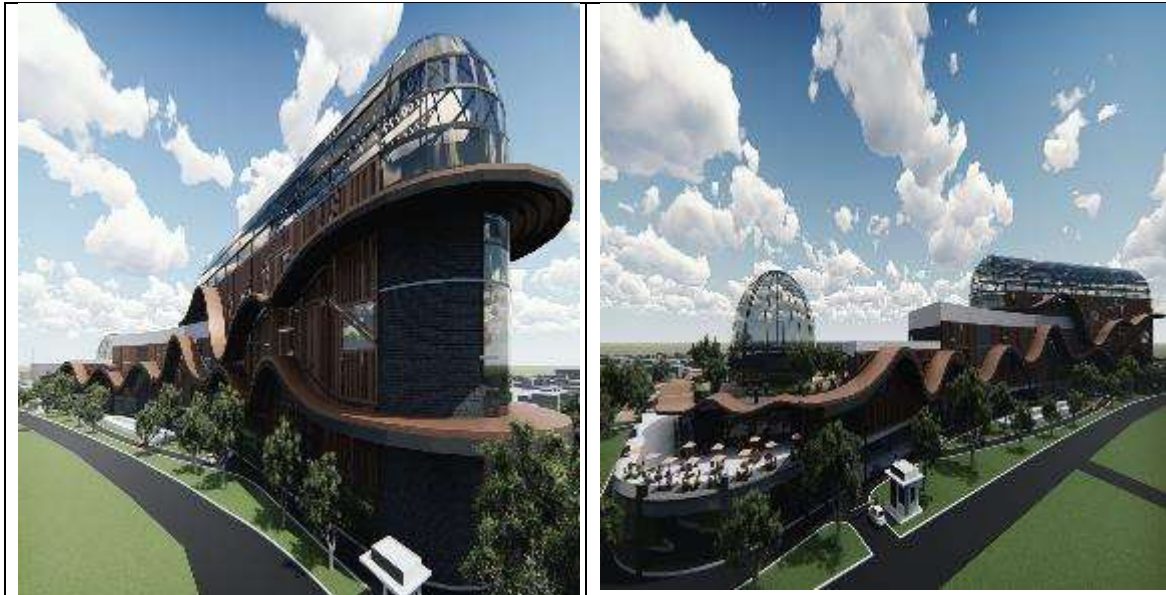


Figure 8. Building Ekterior Pespective  
[Source: Ilham, 2021]

(2) Sclupture starfruit in the library garden, as a symbol of the city of Depok. Since ancient times, Depok city has had a large area to cultivate fruits, especially starfruit. The aim is as a reminder to the wider community to always preserve local potentials, because their existence has begun to decrease;



Figure 9. Starfruit Sculpture and Library Garden  
[Source: Ilham, 2021]

(3) Using environmentally friendly materials, bamboo for façade building and steel exposed especially on the roof of the building, as well as the used of roof glass which aims to show moderation and the natural surrounding.

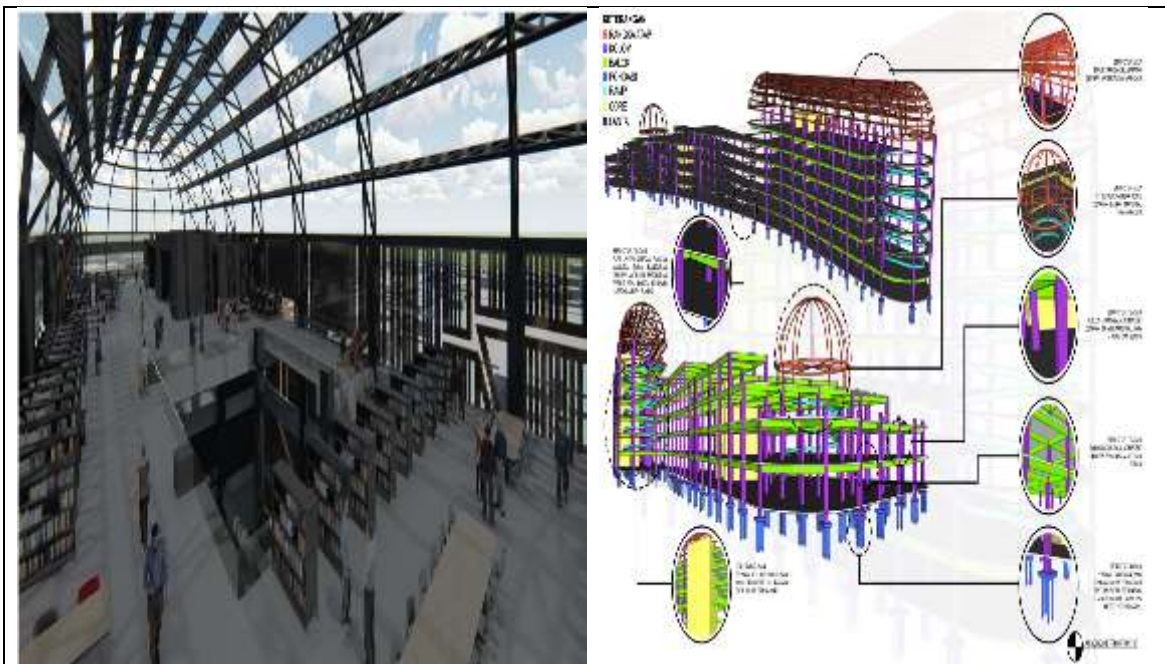


Figure 10. The Building Structure  
[Source: Ilham, 2021]

### Open Space Library and Facilities

Library rooms are designed with openness, in other to make the visitor feel more comfortable and flexible in their activities, as well as a new normal concept which is a health protocol that must be met. In addition, the social celebrity effect



is also an important part of a library's humanistic attraction. Therefore, indoor spaces such as voids which are the core of the building can be used as performance or exhibition areas to attract public attention.



Figure 11. Reading and Public Spaces  
[Source: Ilham, 2021]

As one of the tourist attractions, the library is open to all ages. In consequence, an area for children's library is highly recommended because it is not only a place for reading but also creative activities with the family.





Figure 11. Children Library  
[Source: Ilham, 2021]



Figure 12. Tourism Information Space  
[Source: Ilham, 2021]

An area as a place to find information about tourism destination is also provided in the library, as an integration between the library and the educational tourism accommodation industry, such as residential building and hotel, as well as other tourism industry.

## CONCLUSION

The development of library functions follows the times and current needs. Accordingly, understanding the current conditions is needed as a design consideration. The building and site design that adapts to local environmental conditions will also provide comfort for the users themselves and even the

surrounding residents. As well as creating an environmentally friendly library design by implementing the library tourism attractiveness (educational tourism destination) index system will certainly make people interested in visiting continuously and getting positive benefits. Hence, the local and wider community not only gain knowledge but also freshness and happiness.

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