

Application of Green Architecture Principles in Umbulan Pasuruan Natural Tourism Design

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Abstract- Green architecture is an architecture that consumes natural resources, including energy, water, and material, and minimizes negative impacts on the environment. Green architecture is a step to realize sustainable human life. Green architecture has 3 main principles, namely: energy savings, utilization of renewable energy and the use of local materials. Of the three principles above, it will be applied to pennant natural tourism. Natural tourism is a form of recreation and tourism that utilizes the potential of natural resources, namely a source of water, both in natural conditions and after cultivation, allowing tourists to get physical and spiritual freshness, gain knowledge and experience, and grow inspiration and love for nature.

Keywords— green architecture, natural tourism, Umbulan

I. INTRODUCTION

Green architecture is an architecture that consumes natural resources, including energy, water, and materials, as well as minimally causing negative impacts on the environment, Green architecture is a step to realize sustainable human life [1]. Green architecture has building criteria that refer to the suitability of the building with a tropical local climate, utilize the potential of the site and prioritize environmentally friendly buildings and are sustainable. 'Sustainable' has 3 broad lines namely environmentally sustainable, economically sustainable, and socially sustainable [2].

Thus, Green architecture is one of the architectural approaches that consumes natural resources, including energy, water, and materials, and minimizes negative environmental impacts. According to Tri Harsono Karyono [1] in his book "Green Architecture: an introduction to the understanding of green architecture in Indonesia" there are 3 basic principles in planning Green Architecture written in the report, namely:

- a. Energy Savings:
 - The design and layout of the building mass in a residential area greatly influences the overall energy use of the area.
 - Building orientation, building direction affect physical comfort, and energy consumption.
- b. Utilization of renewable energy:
 - Energy generated from sources whose existence continues or can be renewed quickly
- c. Building material:
 - Building materials that are not healthy recommended should be avoided for use.
 - The use of local materials is recommended so that the energy used for transportation is low.

The principles above will be applied to the design of natural tourist umbulan. The application itself is an act of practicing a theory, method, and other things to achieve certain goals and for an interest desired by a group or group that has been planned and arranged beforehand.

Umbulant nature tourism is a form of recreation and tourism that utilizes the potential of natural resources, which is a spring, both in natural conditions and after cultivation, making it possible for tourists to obtain physical and spiritual freshness, gain knowledge and experience, and foster inspiration and love for natural

II. DESIGN METHOD

The design method used in the design of Pasuruan umbulan natural tourism with the green architecture approach is the Linear Method which refers to AIA (1993) as the stages and design methods which include:



Figure 1 design method
Source: 2019 Design Results

The linear design method is a sustainable method. Starting from briefs, analysis, concepts, and design results.

III. RESULTS AND DISCUSSION

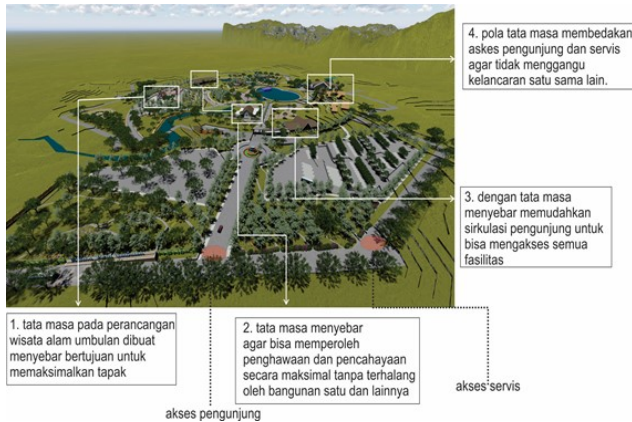
Of the three principles of green architecture according to Tri Harsono Karyono the principles that can be applied to the design of Pasuruan umbulan natural tourism are as follows:

3.1 Energy saving

- Building mass layout
 - a. The mass planning in the design of nature tourism is made to spread aims to maximize the site.
 - b. The time system spreads so that it can get maximum air conditioning and lighting without being obstructed by one building or another.
- Building orientation

How the architecture of the building in such a way is designed so that the room is bright enough without using a lot of lights and so that the air in the room can be cool without the help of air conditioning machines, the direction facing the building affects

physical comfort, the direction facing the building facing south and north to maximize sunlight and wind. For example the application in the design



below:

Figure 2. Building layout
Source: 2019 design results



Figure 3. Building orientation
source: 2019 design results

3.2 Utilization of renewable energy

The energy produced by the spring water source will be maximized as a water resource to maintain its sustainability and benefit the community around the site.

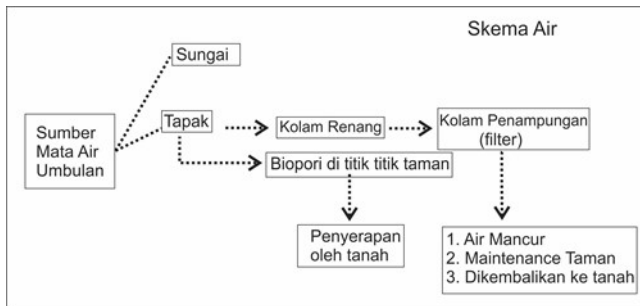


Figure 4. Water scheme
Source: 2019 design results

3.3 Building materials

a. Use materials efficiently and carefully to reduce residual materials, Use materials that are raw materials and the

production process are environmentally friendly, Prioritize the use of processed local materials that are easily obtained around the project area.

b. In the natural tourism area, the focus is to focus more on wood material leftover from furniture work. Below is a design that uses local materials that are environmentally friendly. Among the environmentally friendly local materials are bamboo, pieces of wood from the remnants of furniture and exposed bricks

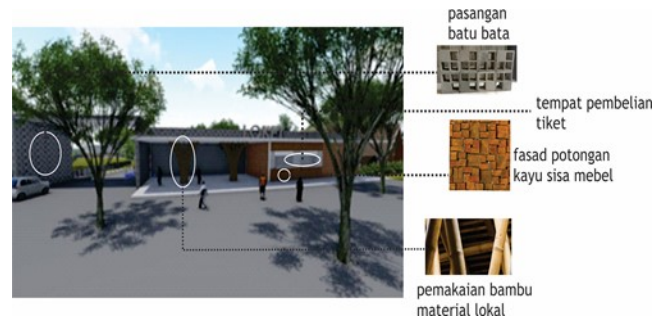


Figure 5. Building material
Source: 2019 design results

IV. CONCLUSION

Green architecture is an architectural approach that consumes natural resources, including energy, water, and materials, and minimally causes negative impacts on the environment. Green architecture which is commonly referred to as 'Green architecture' is a building criterion that refers to the suitability of the building to the tropical local climate, exploits the potential of the site and prioritizes environmentally friendly and sustainable buildings. 'Sustainable' has 3 broad lines namely environmentally sustainable, economically sustainable and socially sustainable.

In the design of natural tourism, the application of the principle of green architecture according to Tri Harsono Karyono produced a concept, namely: back to nature. Back to nature means returning to nature, the concept is motivated by the three principles of green architecture itself: energy saving, renewable energy utilization, and building materials. Energy savings are applied to the layout of the building period, renewable energy utilization is applied to the design of the existing water on the site, and building materials are applied to the use of local materials.

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