

Study of Sustainable Architecture Concepts

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ABSTRACT

The purpose of this study is to analyze the study of sustainable architecture concepts. Sustainable architecture also known as green architecture is an architectural concept that seeks to minimize the negative environmental impact of buildings with efficiency and moderation in the use of materials, energy, and development space and ecosystems at large. Sustainable architecture uses a conscious approach to energy and ecological conservation in the design of the built environment or the theory, science and style of buildings designed and built in accordance with environmentally friendly principles.

Keywords: Architecture, Concept, Green, Sustainable

INTRODUCTION

Sustainable architecture is becoming a very popular thing in the modern era, when urban density is getting higher, and green open spaces are decreasing, and the use of renewable energy is far from a fire. Awareness of the importance of the concept of sustainability emerged. The relationship of the building to its context is taken into consideration in the design process. In towards the concept of sustainability, we can learn from the architectural wisdom of the archipelago. Cultural richness and diversity of natural conditions bring architectural diversity in the archipelago (Manurung, 2014).

Sustainable architecture has many notions from various parties. Some of them are the understanding quoted from James Steele's book, sustainable architecture is.

"Architectures that meet the needs of today, without jeopardizing the ability of future generations, to meet their own needs. Those needs differ from one community to another, from region to region and are best determined by the communities concerned." According to James Stevens Curl and Susan Wilson (Authors of the Oxford Architectural Dictionary), "Sustainable Architecture is architecture that does not waste energy, does not require expensive maintenance, and is not a building that has poor insulation or too much glass."

According to (Suyer, 2009) sustainable is an applied concept in the field of architecture to support the concept of sustainability, which is a concept of maintaining natural resources to last longer which is associated with the vital potential lifespan of natural resources and the human ecological environment, such as the planet's climate system, agricultural systems, forestry industry, and of course architecture. Natural damage due to the exploitation of natural resources has reached the level of destruction globally so that slowly but surely, the earth will increasingly lose its potential to support human life, due to various exploitations of nature. The scheme of sustainable development is found at the meeting point of three environmental, social, and economic spheres.

The figure below explains that sustainable development requires three sectors that are equally strong and mutually supportive, namely; economic growth, protection from the adverse effects of development and

improvement of people's quality of life (Danasastro, 2010, p. 9).



Figure 1. The concept of Sustainability

LITERATURE REVIEW

There are two opposing points of view in placing human nature in the environment. The first is the view that believes that the environment and all its contents are created to meet human needs alone and when a choice is faced between human interests and the environment, then human interests must always be above all else, this view is called anthropocentric ethics (Rachman, 2011).

Sassi (2006) added that the threat to the environment is not only due to human activities, but also due to swelling human populations, especially in developing countries with low / poor living standards. The correlation between environmental damage and poverty lies in the way natural resources are processed and waste disposal without proper recovery efforts due to limited knowledge, finance and adequate technology.

Another opinion by Williamson (2003) states that manufactured risk is a direct impact of excessive use of technology due to an increase in population and lifestyle desires above the standard, the statement is indirectly directed at countries with high standards of living or developed countries.

The second view is a view that places the environment with everything in it and

humans standing on equal footing and each has the right to have a place on earth, such a view is referred to as non-Anthropocentric/Econcentric. Currently, not a few parties are beginning to realize the importance of Ecocentric ethics.

MATERIALS & METHODS

This research is a qualitative descriptive research with a literature study research method through literature studies sourced from journals from previous research results (Kurniawan, 2014) related to the title, also through access to data obtained from website as an informational publication. Qualitative descriptive research can mean that researchers as a key instrument by which data collection techniques are carried out by combining and inductive data analysis (Sugiyono, 2012) so as to produce and process data that It is descriptive such as narrating the results of interviews and/or observations.

RESULT

Sustainable architecture is also referred to as green architecture or environmental architecture. It challenges architects to produce smart designs and use available technologies to ensure that structures

generate minimal harmful effects to the ecosystem and the communities.

Recently, for some people the idea of sustainable design has become the basic criterion of architectural design. Frequently, however, many buildings that are claimed as sustainable are only so in terms of the design. All these talk about sustainability, only using sustainable techniques without concern for the results or consequences or, worse, the word 'sustainable' or 'sustainability' is attached to an ordinary building. To improve the world so as to become close to sustainable conditions, architecture should be designed for sustainability, using sustainable ideas and techniques as the basic design criteria. With the support of a sustainable milieu, including sustainable behaviour and management as well as sustainable political and social conditions, architecture could be part of sustainability or be sustainability (Chansomsak, 2008). This idea of architecture as sustainability shows the interrelationships of people and the non natural environment, of which architecture is a part, and emphasises the aims of development that are not for 'external' goals to achieve sustainability but for architecture for own sake that is sustainability.

DISCUSSION

Principles of Sustainable Architecture

According to the Brundtland commission chaired by Harlem Brundland, the Brundland commission is the name for the World Commission of Environment and Change (World Commission of Environment and Development) which uses 5 principles of sustainable architecture, namely:

1) Energy use efficiency

Make maximum use of sunlight for natural lighting during the day, to reduce the use of electrical energy. Utilizing natural air conditioning instead of artificial air conditioning (Air conditioner). Using ventilation and openings, daytime air conditioning, and other innovative ways. Utilizing

rainwater in innovative ways to collect and treat rainwater for domestic purposes. The concept of efficient use of energy such as lighting and natural air conditioning is a specific concept for tropical climates such as Indonesia.

2) Land use efficiency

Using as necessary the existing land, not all land must be used as buildings, or covered with buildings, because thus the existing land does not have enough green land and parks. Using land efficiently, compactly and integrated, the green potential of plants in the land can be replaced or maximized with various innovations, such as making roofs on buildings (roof gardens), hanging gardens (by hanging plant pots around the building), hedges or that can be filled with plants, walls with gardens, on walls and so on. Appreciating the presence of existing plants in the field, by not easily cutting down trees, so that existing plants can be part of sharing with buildings. Open design with spaces open to the garden (corresponding to greater space flexibility).

3) Material use efficiency

Utilizing waste materials for use also in construction, so as not to dispose of materials, for example leftover wood can be used for other parts of the building. Utilizing used materials for buildings, old components that can still be used, for example the remnants of demolition of old buildings. Using materials that are still abundant and rarely found as well as possible, especially for materials such as wood.

4) Using new technologies and materials

Harnessing the potential of renewable energy such as wind, sunlight and water energy to generate domestic electrical energy for homes and other buildings independently. Harnessing new materials through new discoveries globally can open up opportunities to use renewable materials that are fast produced, cheap and open to innovation, such as bamboo.

5) Waste management

Create a domestic waste treatment system such as dirty water (Black water, Grey Water) that is independent and does not burden the city water flow system. Innovative ways that are worth trying such as making organic waste decomposition systems to decompose naturally in the field, making objects that are ordinary into waste or domestic waste from materials that can be recycled or can be easily decomposed naturally.

By using sustainable architecture (sustainable architecture) is expected to provide the meaning of sustainable culture, a continuous and uninterrupted culture. In addition, in the context of buildings with the application of sustainable architecture so that the building gives a comfortable impression and aims at environmentally friendly development, which utilizes the potential of nature as much as possible.

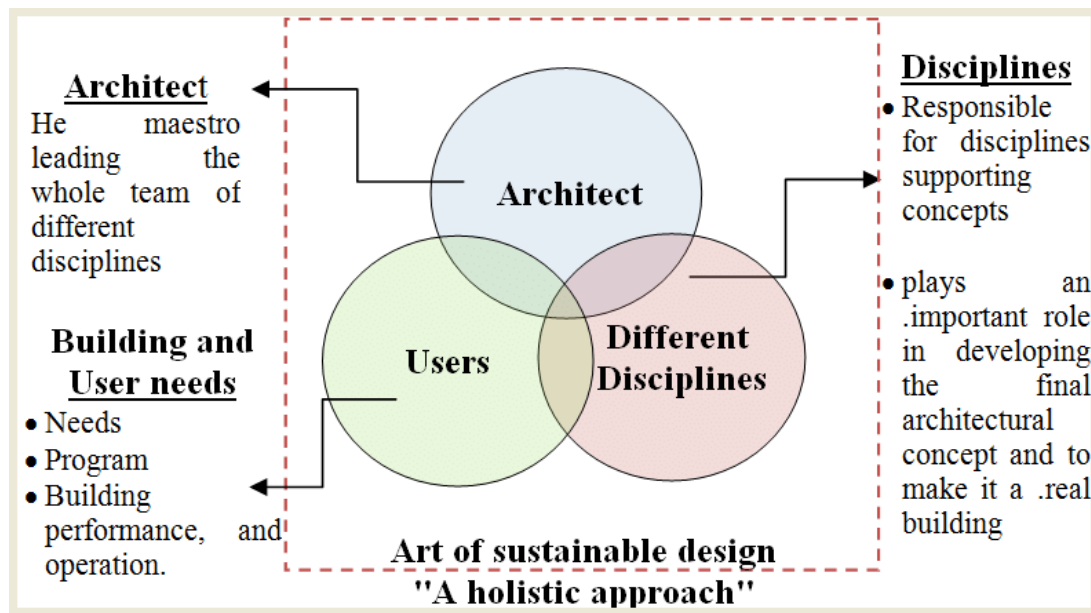


Figure 2. Art of Sustainable Design A Holistic Approach

Sustainable Architecture Concept

To build a sustainable architectural concept, green restoration, such as farmland and forests, and the creation of a comfortable environment are the most important factors. Unlike the past when architecture demanded environmental sacrifices, in this environmental century an architectural design is needed that reduces the burden on the environment by using natural energy and can also be sustainable over time.

The importance of the concept of sustainability increases every day, this is based on the direct proportion to the increase in the number of human populations over time and the decline in existing natural resources (Gissen, 2003).

Sustainable Design which is part of sustainable development in the implementation of its design pays attention

to physical objects, the built environment, and service facilities that comply with social, economic and ecological principles. The three principles of sustainable design in the concept of a sustainable city (Sustainable City) develop further, which is not just fixated on the initial concept which is more focused on the thought of sustainability and environmental balance alone.

Thus, sustainable design is a design to overcome the conditions that occur today related to the global environmental crisis, the rapid growth of economic activities and human populations, depression of natural resources, damage to ecosystems and loss of human biodiversity. Sustainable Design seeks to reduce the negative impact on the environment, health and comfort of building

occupants, thereby improving building performance.

- a. Economic Sustainability

- b. Social Sustainability
- c. Environmental Sustainability

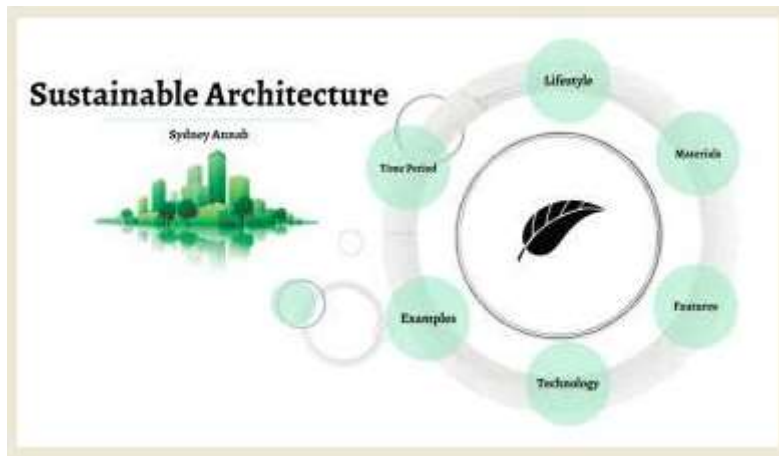


Figure 3. Sustainable Architecture

Characteristics of Sustainable Architecture

In planning and designing a building, of course, there are several characteristics that can be used as a reference for sustainable architectural design, as for the description as follows:

1. The shape of the building mass
The shape of the building mass is a depiction of the environment where the building is located, for example there is

a building that is on the beach with waves or waves and beautiful beaches and plants that decorate the area. The mass shape of the building will look very beautiful, if it absorbs the surrounding elements ranging from the movement of the waves, the coastline to the whirr of the wind that blows, in order to achieve harmony between the built environment and the natural environment. (Idedhyana, 2016).

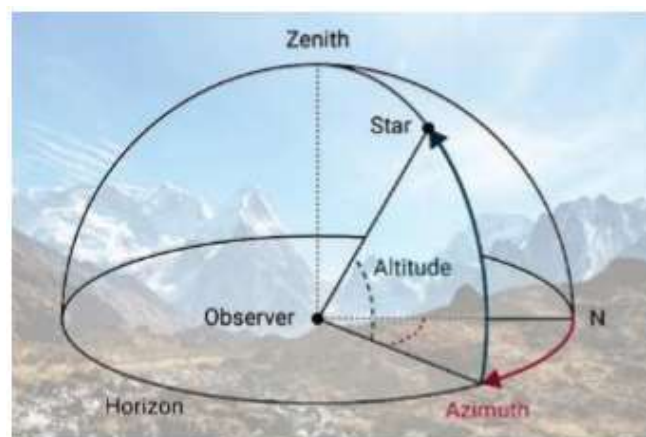


Figure 4. The path of movement of the sun

2. The orientation of the building towards the sun
The absorption of sunlight in building design can be known through the movement of the sun from sunrise to sunset, using a sun path diagram. This diagram is a circle with the probe point

in the center as the center. The circumference line is the horizon, and the determining coordinates are Azimuth and Altitude (figure 02). By knowing the path of movement of the sun we can determine the location of

- openings and parts of buildings that are exposed to direct sun.
3. Local wisdom
Each region certainly has its own characteristics, especially those that are with other regions, sites and buildings that stand in an area will have their own value if they are able to represent local wisdom in the region into sites and buildings.

CONCLUSION

Sustainable architecture is architecture that helps reduce the negative impact of buildings on the environment. This must be done efficiently using materials and energy and ecosystems on a larger scale. The term sustainable is also known as green architecture. Sustainable architecture is an integrated part of sustainable development, which is an important concern today. Sustainable development meets the needs and demands of life without sacrificing conditions and resources for people in future generations.

Declaration by Authors

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