Ecology and Architecture in the art of making an Aesthetics Artwork

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Abstract. Architectural inspiration comes from a combination of various multidisciplinary sciences. One of the combinations that inspire Architects to produce works is the combination of Ecology and Architecture, where each other is interrelated. Ecology and natural forms in Ecology can inspire new architectural forms. This paper will discuss the origin of inspiration from ecology that can be applied in Architectural Aesthetics. The method used is to collect precedent studies and literature studies related to these matters. Then, in the end, the works of Bina Nusantara University Architecture Students who designed Aesthetics forms from Architectural Ecology installations will be shown in the Aesthetics course. Experimentation experiments and discussions can inspire students to produce an architectural work from the aesthetic form of a combination of Ecology and Architecture.

1. Introduction

Ecology in architecture is closely related to how other living things can live together with humans in the same building and one neighborhood district. Other living things have different ecosystems and habitats where they live. An ‘ecological understanding of systems’ means understanding how the components of a living system function together and make the system what it is. Ecology concerning architecture requires architecture as a shelter to protect these habitats and from the analogy of the existing natural ecosystem flow system. Water conservation in one building is an analogy for processing water flows from rain on a mountain. Accommodated and distributed to all parts of the building that need it. This Ecological Approach in Architecture opens the discourse and connects it with the Sustainability knowledge discourse. Sustainable means support, in nature each other supports the formation of a good ecosystem and the analogy in architectural work. Where all elements of Architecture become parts that support each other, this Ecology and Architecture provide a lot of understanding and even gives a new aesthetic style in the world of Architecture. Making an Aesthetics artwork is a way to make an experiments of Design thinking into finding Architecture building form.

Peter G. Rowe in his book Design thinking explain about : The design of buildings can be viewed in a number of ways. First, it can be seen from the perspective of the historical record of production-the lines, shapes, and masses of past buildings and urban artifacts interpreted according to various Aesthetic, canons, social circumstances, and technical opportunities. Second, it can be examined for its conformity with theoretical prescriptions of what constitutes “proper” architecture and “good” design [1]. The Second way of Design thinking which the design of the building can be viewed with theoretical proper and good design with the Ecology approach will be discussed in this paper. And finally, after All data about the Good Architecture building is compiled then analyze, with
diagrammatic, at the end will be shown with the experiments of Architectural students in their work using Ecology and Architecture to obtain or search for existing forms of Aesthetics.

1.1. Ecology and Architecture

The Ecology knowledge that influences the Aesthetics finding to artform in Architecture can be grouped as:

1. The living things ecosystem flow for sustainability forces the design to fulfill the need to keep alive in many ways.
   - The place for living things such plants given space priority in design because it represents the green to make fresh air and biophilic atmosphere
   - The space for living things to grow, give priority in spaces in the facade and whole building form

2. The Form represents the sustainability elements, from water management, water management, energy efficiency, and recycle material

3. The intangible in sustainability image: Natural, social and technique give many contributions in form making where all be focused in:
   - The image of natural, besides preservation maximal in green areas, and making more spaces in green for trees, plants, and other fauna needed, it can represent all the green from a small building to highrise, and from rural to urban
   - The image of Technique: The energy efficiency can be shown in the solar shading aesthetics form, whether it's sensory or aesthetics secondary second pattern
   - The Social image is presented in the flowing or circulation in the building. The scale can be a city, neighborhood, and building

All of that matters in the form making from outside as well as inside. As De Bono mentioned that the way to gained a serious activity by lateral thinking is to make a lot of alternative unique design [2]. The ecology knowledge above can be used as the background of many ideas to make an Aesthetics Artwork to Architecture building with many alternatives and many way of perspectives view

1.2. Ecology application in Architecture

There is a paradigm shift about aesthetic beauty when ecology is linked with architecture. No longer just decorating buildings, but aesthetics that are focused on providing lots of plant vegetation, plants, or space for other living creatures to coexist with humans in one building, as in the following example.

![Fig 1](https://www.archdaily.com/777498/bosco-verticale-stefano-boeri-architetti/564e7c1ee58e4730003a3-bosco-verticale-stefano-boeri-architetti-photo?next_project=no)

(this picture taken on 27 October 2021)

2. Methods
This paper is research that aims to formulate the relationships and influences that are interrelated with Ecology and Architecture. Therefore, all of them use a qualitative approach by taking several existing precedent studies, then sorting again and reformulating with certain classifications and classifications to facilitate the explanation. Then after getting the essential element relationship between Ecology and Architecture, a study experiment was made in the Aesthetics course in the Department of Architecture to experiment with using these conclusions between Ecology and Architecture.

3. Content

3.1. The Relationship between Ecology and Architecture

The Relationship between Ecology and Architecture can be described as:

Ecology Uses Architecture As

1. Representation of the function of buildings related to ecology in the form of architecture. An example is Garden by the Bay, wherein it is the breeding of various types of flower and plant varieties, and the overall design of the building applies the principles of Sustainable Architecture.

2. A place where various other living things can coexist with humans in a work of Architecture

The architecture uses Ecology as:

1. Analogy uses natural ecosystems in a building. For example, Bjark Ingals' work in an apartment entitled "mountain" where the shape is like a mountain and the concept of circulation.

2. Using a variety of plants and animals to live together and be bred in architectural work.

When Ecology uses architecture to represent the function of buildings related to ecology in the form of architecture, then architecture is only considered a protective shelter from the ecology beneath it. The protected ecology is a specific group of ecosystems that can be produced from breeding in it. Architecture serves to shade all of that so that it can generate well and become or create diverse and beautiful varieties. The architecture presented is attempted with the concept of protecting and using materials, structures, and wide-span technology so that plants or living creatures underneath can move freely. It can be seen from the diagrammatic at Figure 2 below.

![Diagrammatic 1](www.archdaily.co)
3.1.1. Ecology in Architecture.
When Ecology uses architecture as a place where various other living things can coexist with humans in a work of architecture, here there is a change in the aesthetic paradigm of form that thinks about decoration into thinking to preserve the environment and the living things in it. The architecture here plays a role in providing or creating unique spaces or spaces in the function of the building so that plants can live and carry out their lives. For example, on a balcony designed with a vertical garden, and many more, the use of a roof garden roof is also increasing. A few years ago, the roof section was a roar that was thrown away not only for utilities, but the paradigm changed or above became green plants for residents to enjoy the city’s beauty from the top roof.

When architecture uses ecology as an analogy to using natural ecosystems in a building, it is the position of architecture to be a substitute for nature. For example, a mountain concept is associated with plants in the mountain, and the roots that store water in the ground are analogous to a work of high-rise building architecture. On the beams and roofs, there are many tree plants. The drainage of dirty water for irrigation is recycled continuously to water the plants or the existing water conservation concept. It is analyzed that a building is a high ground where rainwater is collected by the soil and then flows in an area. This analogy applies to buildings, where rainwater is stored in a reservoir and used in water closets, plants, and others.

When Architecture uses Ecology as Using a variety of plants and animals to live together and breed in architectural work, Architecture seeks to live together with nature with various existing sustainability concepts. Not only that, living side by side not only in buildings but also in a district and environment by working together to create plant designs in a good atmosphere. Norman Foster's Science Center has made Architectural Work a shelter to breed the various types of ecology that exist and succeeded in presenting the formations that occurred because of the needs in it.

Garden by the bay is the same as making architecture a shelter, but Bjark Inglas' work of creating a shelter or house for elephants provides an interesting opportunity for architects. Likewise, it's interesting to give its aesthetic paradigm shift by living with other living things. At the core of everything, there is a paradigm shift from beauty to coexistence and happiness with living creatures and nature as be seen in the Figure 3 below.

![Diagram](www.archdaily.com)

Fig 3. Diagrammatic 2 by Author and picture from www.archdaily.com

3.1.2. Design of the Ecological building
The design of the building that uses the concept of ecology is more related to the idea of ecology itself in the building than the aesthetic game of the existing forms. How humans and other living things and nature can live together beautifully in one building or architectural work. This unity is prioritized in an architectural work with an ecological approach. The natural image where the life of the food chain must be maintained is also essential in a work of building design with an environmental concept. The ecology of sustainability and the relationship between living things is given space in buildings and can live reciprocally together even though cities are increasingly being built with buildings. It can be seen in the diagram Fig 4 below.

![Diagram](image1.png)

**Fig 4.** Diagrammatic 3 by Author : Yanita Mila Ardiani

### 3.1.3. The Ecology Knowledge

The space for living things to grow give priority to spaces in the facade and whole building form. The Form represents the sustainability elements, from water management, water management, energy efficiency, and recycle.

![Diagram](image2.png)

**Fig 5.** Diagrammatic 4 by Author : Yanita Mila Ardiani

The Figure 5 explain that the Form experiment obtained from the Ecological approach in an Aesthetics work was a paradigm shift when buildings classified as beautiful have pleasing aesthetics and are replaced with buildings that are more friendly to nature. Both in the exhaust system the use of building materials and the use of energy into the building. The use of this energy can be made by adapting the
local climate, which can be made by playing Aesthetics or aesthetics in the form of the front facade by approaching or taking the form of nature. One of the Application of Ecology Concept practices in making creative forms is blended in the Aesthetics course at the Department of Architecture in Bina Nusantara University, Indonesia. This is where students learn about the exploration of forms, which are used to achieve ecological aesthetics.

3.2. *The Artwork of Ecology inspiration made by an Architecture student*

The following is an example of a student who made design work from the analogy of a mountain and another inspiration from sand that can be moved kinetically. Some of the students use the theory of Folding Architecture where all sides can be fold according to Sophie Vyzoviti book [4], as we can see in the figure 6a. The form as an analogy of a mountain as the sustainability resources from ecology of the earth. Some of the students experiment with the theory from Softshells by Sophie Vyzoviti book [5], as we can see in the fig 6b. The form represent sand with kinetic forms as an analogy in the Ecology of the dessert.

![Fig 6a and 6b. Picture of Aesthetics project by Bina Busantara’s students under the Lecture class of the Author: Yanita Mila Ardiاني](image)

4. **Conclusion**

The Ecology knowledge that influences the Aesthetics finding to Artform in Architecture can be examined for its conformity with theoretical prescriptions of what constitutes “proper” architecture and “good design. In this paper, not only good design inspired from Ecology design to make sustainability forces the design to fulfill the need for them to keep alive in many ways and fulfill the requirements to Energy efficiency. But much other Architecture building form has the ideas from that Ecology Architecture into many forms with an experiment in the Aesthetics form to make a good and proper design.

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