MDPI

Open Access Article

Reinterpreting Sustainable Architecture: What Does It Mean Syntactically?

by Jae Hong Lee

Department of Architecture, Gachon University, Seongnam 13120, Korea

Sustainability **2020**, *12*(16), 6566;
https://doi.org/10.3390/su12166566

Submission received: 30 June 2020 /
Revised: 6 August 2020 /
Accepted: 9 August 2020 /
Published: 13 August 2020

(This article belongs to the Special Issue **Towards a Sustainable Life: Smart and Green Design in Buildings and Community**)

Download Browse Figures

Versions Notes

Abstract

…can sustainable architecture be described spatially? Is there any way of looking at

spatially? Is there any way of looking at sustainable architecture from a spatial perspective? This paper aims to explore whether a syntactical viewpoint would be an appropriate focus, and attempts to address how a configurational approach contributes to our understanding of sustainable architecture. To explore the possible theoretical framework in understanding sustainable architecture from a spatial perspective, three buildings (namely, Olympic House, SK Chemicals R&D, and the Epson Innovation Center), which are recognized as the most sustainable buildings by Leadership in Energy and Environmental Design and Comprehensive Assessment System for Built Environment Efficiency, are selected and analyzed by using visibility graph analysis, a useful analytical tool in space syntax. The in-depth theoretical studies and literature reviews have suggested that the atria in sustainable architecture play a substantial role in maximizing energy efficiency, minimizing negative impacts on the environment, and generating spatial integration. Thus, it is concluded that sustainable architecture is economical in technological, environmental, and spatial ways as well.

Keywords: sustainable architecture; space syntax; partitioning theory; total depth; intelligibility; movement economies

Top

1. Introduction: The Problem of Sustainable

1. Introduction: The Problem of Sustainable Architecture

Space has long been a key issue in areas of architectural research, and this topic attracts the attention of many different disciplines, such as cognitive science, environmental psychology, environmental graphic design, and even sociology. That is, a built space not only works as a physical shelter, but it is also a "meaningful and informative formation expressive of the culture and lifestyle of different societies and of the transformations that the social structure has experienced" [1] (p. 54.1). It is the distinctive characteristics of social systems that embody spatial formations, and spatial formations, in turn, can be seen as "visual symbols of societies" [2]. If this is so, what is the problem in understanding sustainable architecture?

It has been admitted that sustainable architecture is an architecture which aims to maximize energy efficiency by using the most modern technologies and, in turn, minimize negative impacts on the environment. In addition, there are diverse viewpoints regarding sustainable architecture that go beyond such a technological viewpoint. Guy and Farmer (2001) present six alternative logics of ecological design—eco-technic logic, eco-centric, eco-aesthetic, eco-cultural, eco-[illegible]ical, and eco-social—and one of the [illegible]ns why they try to identify such aspects is to argue that sustainability is not an

Top

uncontested single homogeneous concept, but should be understood as an interpretative flexible one, because "debates about sustainable architecture are shaped by different social interests, based on different interpretations of the problem, and characterized by quite different pathways toward a range of sustainable futures" [3] (p. 146). Susan Maxman also suggests that sustainable architecture is not "a prescription" but "an approach" and "an attitude," and therefore, it "should be just architecture" (cited in [3] (p. 140)). Further, Guy and Moore contend that "we need to recognize and analyze green buildings as a series of contingent hybrids, an understanding of which is inseparable from the encounter with the people and places that shaped their design and development" [4] (p. 3). In this way, sustainable architecture should be seen not only as an ecological context but also as an activity of constituting a spatial layout and forming human behaviors.

However, it is not clear how strongly sustainable architecture is related to spatial formations, and how it characterizes spatial configurations. This paper, therefore, aims to shed light on creating a new framework of viewing sustainable architecture from a spatial perspective, and to provide a substantial understanding by looking at in-depth literature reviews and case studies.

Top

2. Sustainable Architecture