

Editorial

Environmentally Conscious Architecture: Local–Global, Traditional–Innovative, and Cultural Challenges

Ute Poerschke ^{1,*} and Susanne Gampfer ²

¹ Department of Architecture, The Pennsylvania State University, University Park, PA 16802, USA

² Department of Architecture and Building Science, University of Applied Science Augsburg, An der Hochschule 1, 86161 Augsburg, Germany; E-Mail: susanne.gampfer@hs-augsburg.de

* Author to whom correspondence should be addressed; E-Mail: uxp10@psu.edu; Tel.: +1-814-865-4238; Fax: +1-814-865-3289.

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1. Introduction

Recent outcomes of world energy summits and fruitless struggles for global environmental goals seem to suggest that these are times of declining efforts for a consensus on strategies to mitigate the impact of human activities on the world climate—not least in the building sector. The worldwide banking crisis, concerns about the Euro, and an insecure economic situation in the U.S. have once again led to a situation in which economic interests have gained predominance over ecologic responsibility of the industrialized nations. Germany’s most recently signed coalition agreement takes several steps back from what has been termed “Energiewende” in the past few years. A fast and efficient increase in the use of regenerative energy sources has been slowed under the obvious pressure of the energy industry, while old fashioned coal power stations are granted yet another extension—placing the economic fear of lost jobs over an ecologic rationale of cleaner energy. Similar examples of industry driven decision-making are the expansion of fracking in the U.S. and the reopening of Japan’s nuclear power plants. Despite the memory of the Fukushima accident, the Japanese government and the majority of the people believe that any decline in economic growth holds more dangers for the country and its population than obviously hazardous technologies. Looking back at the past three decades, it seems that there have been times when ecological thinking and acting were more wide spread, had a better image and more significance. The 1970s energy crises, but also a societal consensus in the 1980s and 1990s led to an ecological movement influencing consumer behavior, fashion, and architecture.

Set against this background, this journal issue focuses on one aspect of human behavior impacting the planet, on making architecture. Buildings form the environment in which many people spend up to 80% of their lifetime. They need a significant proportion of the world's resources for their construction, use, maintenance, and demolition. It is imperative, therefore, to continue addressing the question of what can make buildings and the process of building environmentally conscious—locally and globally, and from two perspectives: from “inside out” as human beings observing how they impact the environment, and “from outside in”, looking at how a specific environment has shaped its inhabitants. In reality, and therefore also in the articles collected in this special issue, the position lies in between these perspectives, almost regardless of the authors' field of practice or country of residence.

This Special Issue of *Buildings* brings together articles that interpret and question the meaning, content, and goals of environmentally conscious architecture. It goes beyond addressing mere energy efficient building by reflecting on the relationship of architecture to context, ethics and aesthetics, and to specific climate, cultural and/or economic conditions. The contributions cover various perspectives, which partially arise from the fact that the authors come from diverse locations and cultures around the world, from Korea, China, Egypt, Sweden, Norway, Switzerland, Germany, and the United States. They discuss the topic from different disciplines such as cultural sciences, socio-economics, legislation, professional practice, building technology, and aesthetics. The articles touch on the diverse scales environmentally conscious architecture can have, from detail to urban planning. Some have a global approach, meaning that the conclusions they provide are adaptable to many industrialized countries. Others have a highly local approach, looking for solutions for a specific problem at a particular place, such as the sea-level rising in the Nile-Delta. Finally, theoretical articles can be distinguished from those with a practical approach, elaborating on built work or specific building elements.

2. Approaches to Environmentally Conscious Architecture

When discussing the articles for this issue, we interpreted them as contributing to three general approaches concerning environmentally conscious architecture: the first can be characterized as a technical-aesthetic approach; the second relates to socio-economic-political questions of implementing environmentally conscious architecture; and the third area attempts to understand environmentally conscious architecture from cultural aspects. Many articles naturally relate to two or all three of these approaches. However, in the following, we related each article to the one we found most relevant.

Franca Trubiano's article “*Performance Based Envelopes: A Theory of Spatialized Skins and the Emergence of the Integrated Design Professional*” [1] can be considered to belong to the first area, the technical-aesthetic approach. The author observes a shift in the interpretation of architecture where a building's envelope and technical systems (heating, cooling, ventilation, lighting, *etc.*) are aligned toward one technical-aesthetic entity. This interpretation results in façades with increased depth, the arrangement of multiple façade layers, and active responsiveness of these layers to changing climate factors and human needs, including representational needs. The author emphasizes benchmarking as a crucial process to improve such performance-based envelopes. Therefore, the reinterpretation of the envelope has created new technical professions: façade engineers, modelers/simulators, and auditors. Technically speaking, the emphasis of today's architecture is on energy reduction and augmented

human comfort; aesthetically speaking, it is on the representation of environmentally responsible clients who use superior technology.

The second article with a technical-aesthetic approach is “*Sustainable Building in China—A Green Leap Forward?*” by Richard C. Diamond *et al.* [2]. Based on the dramatic economic growth in China, the authors acknowledge it is imperative to address the subject of environmentally responsible architecture. They present a case study of a low-energy office building in China, which, according to the authors, implements over 40 sustainable strategies. The article focuses on measured performance data of energy usage, water consumption, and occupant satisfaction. The authors’ approach can be considered technical-aesthetic in so far as it follows an internationally accepted architectural appearance that merges state-of-the-art passive and active strategies of energy reduction and implementation of renewable energy resources.

The second set of articles addresses social, legislative, and economical questions of environmentally conscious architecture. Jeffrey Brownson asks in his article “*Framing the Sun and Buildings as Commons*” [3] important overarching questions that we all too often forget. Who owns the environment? Specifically, if sunlight, a fundamental asset needed by everybody to live, is a common good, how can communities share it? How can solar energy conversion systems, such as windows, photovoltaics, and solar thermal become a common good, too, so that each person of a community can make use of her/his right to sunlight? The author discusses how communities can develop such shared devices to become independent from large external energy providers.

A very different question is asked by Krishna Bharathi and Lee Ann Nicol in their paper “*Between Research and Practice: Experts on Implementing Sustainable Construction*” [4]. Utilizing the field of science and technology studies, the authors attempt to identify drivers and barriers for implementing energy saving strategies in the building industry. Basing their study on the research by Pitt, Tucker, Riley, and Longden, who defined financial incentives and building regulations as the main perceived drivers and affordability as a main perceived barrier, they identify additional challenges categorized as social, regulatory and technology oriented. As one such barrier, they discuss as a key finding the frictions between researchers, practitioners and public authorities, or, in other words, the frictions between innovation and regulation.

The article “*Energy-Efficient Technologies and the Building’s Saleable Floor Area: Bust or Boost for Highly-Efficient Green Construction?*” by Agnieszka Zalejska-Jonsson *et al.* [5] is based on the situation in Sweden where the most common approach to reduce the need for a building’s heating energy is to increase insulation thickness and utilize more effective insulation materials for outer walls. The authors elaborate on the potential conflict between the ever-rising demand of the building envelope’s insulation thickness in order to reduce energy consumption and its economic downside of reducing saleable floor area. They compare two strategies in respect to cost during a building’s life cycle: either adding conventional insulation or alternatively utilizing more effective, but also more expensive insulation products.

The third general approach to environmentally conscious architecture asks about the cultural meaning of climate, natural environment, social behavior, human comfort, energy reduction, and resiliency toward a changing climate. Two papers look into specific cultures—Egypt and Japan—to detect explicit regional approaches related to environmentally conscious architecture.

In their article “*The Role of Environmentally Conscious Architecture and Planning as Components of Future National Development Plans in Egypt*”, Karim Ayyad and Mostafa Gabr [6] present the thesis that environmentally conscious architecture in Egypt was more successful in the past, when it was related to a particular regional culture, than in the monarchic, socialist, and socio-capitalist eras, when orientation to foreign cultures prevailed. Egypt’s hot-arid climate, the majority of the land being desert, the accumulation of the population in the Nile valley, and climate change have led to the main challenges of water, food and electricity shortage and the destruction of arable land caused by both urbanization and sea level rise. Strategies to address these challenges have been the import of food, water, and electricity—global approaches instead of local ones—which have worsened the situation, for example by continuously rising food prices. The authors remind us of architect Hassan Fathi’s attempt to design environmentally conscious architecture grounded in traditional building, respecting the environment instead of ignoring it, as the way Egypt needs to develop further strategies of securing and improving its living conditions.

Finally, Jin Baek’s article “*Fudo: An East Asian Notion of Climate and Sustainability*” [7] takes us entirely away from the interpretation of environmentally conscious architecture as the demand to secure our environment, by drawing attention to the word “conscious”. His article investigates how the Japanese culture has been developing by humans and society being “conscious” of their natural environment. Thus, the natural environment has shaped humans, societies, and cultures first before these have started to dramatically impact it. With lifestyles becoming more similar all over the world, his question is an important one: How does a specific natural environment shape us as human and social beings? His study of how the climate formed the Japanese culture and the way Japanese people lived traditionally together is a reminder for us to live closer with the environment and allow ourselves to be shaped by it.

3. Conclusions

Buildings are environmental interventions with considerable impact on human living conditions. In respect to today’s state of the environment, we all too often forget—albeit common knowledge—that our actions need to be guided by a global goal: to maintain our living conditions for future generations. Reflecting on our actions, however, always needs to start locally, in fact by questioning what our real needs are, and what quality of life means to us in relation to our environment.

All articles are placed between these two ends, the global goal of achieving and maintaining adequate living conditions for future generations and local strategies to satisfy present needs. In the end, it is the responsibility of all people involved in the building process to base their local decisions on this global goal. Comparing three articles might clarify this approach. On the one hand, Zalejska-Jonsson *et al.* [5] limit their investigation to material costs, energy costs, and rent income. This limitation, a reduction of complexity, is necessary to come up with verifiable results. However, other important factors had to be left out, particularly the environmental impact of buildings containing a large amount of hazardous, non-degradable insulation materials as a potential burden for future generations. Therefore, the article needs to be placed within the bigger question of waste generation, which will become a key issue in the near future.

In contrast, Baek's study [7] points us to the necessity to investigate the topic of environmentally conscious architecture beyond technical and economical questions—by describing how the environment is reflected in the Japanese building traditions, societal life, and the things Japanese people give meaning to. On the other hand, his article could present the opportunity to study the local culture also through a technical lens, for example by verifying the actual performance of cross-ventilation in traditional Japanese houses, the underlying conditions such as wind direction, height of openings, vegetation, water basins and other courtyard elements, and the actual resulting benefits. A combination of both approaches—a cultural/social and a technical/scientific one—might be the ideal approach for local design decisions with global responsibility.

Most articles investigate best methods for providing low-impact energy to maintain our standard of living and level of comfort. Only a few of them start with questioning these standards and comfort levels, such as Ayyad and Gabr [6] who propose the lowering of consumption as the first measure toward environmentally conscious living in Egypt. Lowering consumption does not mean lowering comfort, it could mean, for example, to replace turf with indigenous plants in order to reduce intensive irrigation or to avoid the construction of housing and industrial complexes on arable land. Thus, the article points at the necessity to clarify what our actual local needs are in respect to the larger goal defined above.

Conflicts of Interest

The authors declare no conflict of interest.

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