Eco-Adaptive Design/Architecture (EADAA): Beyond Amphibious Architectures

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Abstract

Current climate change and complex social issues poses a challenge to architecture and engineering. New constructions must deal with the increased intensity of natural phenomenon as Hurricanes / Typhoons and their concurrent flooding. Those natural phenomena have a deeper impact on poor communities and areas in underdeveloped countries and regions. This paper discusses the challenges, trends and possible solutions to this situation while proposing a new approach that we have named "
Eco – Adaptive Design/Architecture (EADAA)" and that we consider to be a step forward to "amphibian architecture" and toward a universal approach to deal with natural/environmental constraints, and that may allow us to explore further solutions under a new view. EADAA is proposed as a new view, where designs "self adapt, move & evolve" according to environmental changes. As a research framework, we are also presenting a historical review of traditional solutions and a brief analysis of current trends and solutions in this area. It is our goal that these ideas may encourage new work in this area and also help to the development of this kind of technology, while allowing the use of participative design as a way to integrate situated and traditional knowledge toward context-based solutions that are easily adapted and adopted within the communities where this type of phenomena have a heavier occurrence and impact. Finally, our paper proposes a novel approach for dealing with hurricanes/typhoons and floodings as an example of this new model presented and also discusses the need for this technology to be affordable, open source and widely available for self-construction to comply with current needs worldwide.

Keywords: Amphibious Architecture; Participative Design; Context Based Design; Hurricane and Typhoon Resistant Architecture; Eco – A daptive Design/Architecture (EADAA)

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