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A Biomimetic Structural Form: Developing a Paradigm to Attain Vital Sustainability in Tall Architecture

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Abstract : This paper argues for sustainability as a necessity in the evolution of tall architecture. It provides a different mode for dealing with sustainability in tall architecture, taking into consideration the speciality of its typology. To this end, the article develops a Biomimetic Structural Form as a paradigm to attain Vital Sustainability. A Biomimetic Structural Form, which is derived from the amalgamation of biomimicry as an approach for sustainability defining nature as source of knowledge and inspiration in solving humans’ problems and a Structural Form as a catalyst for evolving tall architecture, is a dynamic paradigm emerging from a conceptualizing and morphological process. A Biomimetic Structural Form is a flow system whose different forces and functions tend to be “better”, more "fit", to “survive”, and to be efficient. Through geometry and function—the two aspects of knowledge extracted from nature—the attributes of the Biomimetic Structural Form are formulated. Vital Sustainability is the survival level of sustainability in natural systems through which a system enhances the performance of its internal working and its interaction with the external environment. A Biomimetic Structural Form, in this context, is a medium for evolving tall architecture to emulate natural models in their ways of coexistence with the environment. As an integral part of this article, the sustainable super tall building 3Ts is discussed as a case study of applying Biomimetic Structural Form.

Keywords : biomimicry, design in nature, high-rise buildings, sustainability, structural form, tall architecture, vital sustainability
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