

## **Biomimetic to Architectural Design for Increased Sustainability**

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**Abstract :** Biomimicry, where flora, fauna or entire ecosystems are emulated as a basis for design, is a growing area of research in the fields of architecture and engineering. This is due to both the fact that it is an inspirational source of possible new innovation and because of the potential it offers as a way to create a more sustainable and even regenerative built environment. The widespread and practical application of biomimicry as a design method remains however largely unrealised. A growing body of international research identifies various obstacles to the employment of biomimicry as an architectural design method. One barrier of particular note is the lack of a clear definition of the various approaches to biomimicry that designers can initially employ. Through a comparative literature review, and an examination of existing biomimetic technologies, this paper elaborates on distinct approaches to biomimetic design that have evolved. A framework for understanding the various forms of biomimicry has been developed, and is used to discuss the distinct advantages and disadvantages inherent in each as a design methodology. It is shown that these varied approaches may lead to different outcomes in terms of overall sustainability or regenerative potential. It is posited that a biomimetic approach to architectural design that incorporates an understanding of ecosystems could become a vehicle for creating a built environment that goes beyond simply sustaining current conditions to a restorative practice where the built environment becomes a vital component in the integration with and regeneration of natural ecosystems.

**Keywords :** biomimicry, bio-inspired design, ecology, biomimicry, industrial ecology

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