

## **Configuration of Water-Based Features in Islamic Heritage Complexes and Vernacular Architecture: An Analysis into Interactions of Morphology, Form, and Climatic Performance**

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**Abstract :** It is increasingly realized that sustainability includes both a response to the climatic and cultural context of a place. To assess the cultural context, a morphological analysis of urban patterns from heritage legacies is necessary. While the climatic form is derived from an analysis of meteorological data, cultural patterns and forms must be abstracted from a typological and morphological study. This current study aims to analyze morphological and formal elements of water-based architectural and urban design of past Islamic vernacular complexes in the hot arid regions and how a vast utilization of water was shaped and sited to act as cooling devices for an entire complex. Apart from its pleasant coolness, water can be used in an aesthetically way such as emphasizing visual axes, vividly enhancing the visual of the surrounding environment and symbolically portraying the act of purity in the design. By comparing 2 case studies based on the analysis of interactions of water features into the form, planning and morphology of 2 Islamic heritage complexes, Fatehpur Sikri (India) and Lahore Fort (Pakistan) with a focus on Shish Mahal of Lahore Fort in terms of their mass, architecture and urban planning, it is agreeable that water plays an integral role in their climatic amelioration via different methods of water conveyance system. Both sites are known for their substantial historical values and prominent for their sustainable vernacular buildings for example; the courtyard of Shish Mahal in Lahore fort are designed to provide continuous coolness by constructing various miniatures water channels that run underneath the paved courtyard. One of the most remarkable features of this system that all water is made dregs-free before it was inducted into these underneath channels. In Fatehpur Sikri, the method of conveyance seems differed from Lahore Fort as the need to supply water to the ridge where Fatehpur Sikri situated is become the major challenges. Thus, the achievement of supplying water to the palatial complexes is solved by placing inhabitable water buildings within the two supply system for raising water. The process of raising the water can be either mechanical or laborious inside the enclosed well and water rising houses. The studies analyze and abstract the water supply forms, patterns and flows in 3-dimensional shapes through the actions of evaporative cooling and wind-induced ventilation under arid climates. Through the abstraction analytical and descriptive relational morphology of the spatial configurations, the studies can suggest the idealized spatial system that can be used in urban design and complexes which later became a methodological and abstraction tool of sustainability to suit the modern contemporary world.

**Keywords :** heritage site, Islamic vernacular architecture, water features, morphology, urban design

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