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Evaluation of the Sustainability of Greek Vernacular Architecture in Different Climate Zones: Architectural Typology and Building Physics

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Abstract : Investigating the integration of bioclimatic design into vernacular architecture could lead to interesting results regarding the preservation of cultural heritage while enhancing the energy efficiency of historic buildings. Furthermore, these recognized principles and systems of bioclimatic design in vernacular settlements could be applied to modern architecture and thus to new buildings in such areas. This study introduces an approach to categorizing distinct technologies and design principles of bioclimatic design based on a thoughtful approach to various climatic zones and environment in Greece (mountainous areas, islands and lowlands). For this purpose, various types of dwellings are evaluated for their response to climate, regarding the layout of the buildings (orientation, floor plans' shape, semi-open spaces), the site planning, the openings (size, position, protection), the building envelope (walls: construction materials-thickness, roof construction detailing) and the migratory living pattern according to seasonal needs. As a result, various passive design principles (that could be adapted to current architectural practice in such areas, in order to optimize the relationship between site, building, climate and energy efficiency) are proposed.

Keywords : bioclimatic design, buildings physics, climatic zones, energy efficiency, vernacular architecture
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