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Design with Nature: Vernacular Buildings Adaptation to Sand Landforms in Sahara Desert

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Abstract : The Sahara desert covers third of the total surface of Africa with a quarter of this area within the national boundaries of Algeria. Sand drift and deposition is considered one of the major factors of the desertification process in the area. It is estimated that a third of the world's hot arid lands are covered by aeolian sand deposits, forming extensive sand bedforms. The Gourrara region in the Grand Erg Occidental (west of Algerian Sahara) and the region of Souf in the Grand Erg Oriental (east of Algerian Sahara) have been chosen as case studies. These were significant cultural and trading centers for many centuries despite their remote location and their harsh desert environment particularly solar radiation and sand drift and deposition. The architecture of the sustained vernacular settlements in each of the two regions has unique design features for this environment. So do the irrigation systems used - palm groves and the foggara system for capturing and distributing groundwater. However, the ecological balance which enabled the Saharans to live with the desert has been upset. New buildings often use technology based on models imported or imposed from areas that climatically have little in common. These make the inhabitants live ‘in the desert’ rather than ‘with the desert’. This paper will describe the qualities of the vernacular architecture and demonstrate its effectiveness and adaptability to the region’s harsh desert environment in comparison with contemporary buildings. Developing design guides and approaches based on lessons from the traditional architecture is important to ensure sustained livelihoods of the inhabitants in these areas.

Keywords : vernacular architecture, desert architecture, hot climate, aeolian sand deposition
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