

Climate-Responsive Vernacular Settlements In Southern Morocco: A Study On The Ksar Of Ait Ben Haddou



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ABSTRACT

Traditional settlements shaped by the hot and arid climatic conditions of southern Morocco offer an important field of inquiry for understanding how environmental adaptation is achieved through architectural and urban decisions. This study aims to examine the relationship between settlement pattern, spatial organization, street system, building forms, local materials, and traditional construction techniques in the climatic adaptation of Ait Ben Haddou, located in the Ounila Valley near Ouarzazate. The study is based on the assumption that the settlement's climatic performance does not result from a single building element or material, but from the complementary interaction of architectural decisions made at different scales. Beyond its historical and formal characteristics, Ait Ben Haddou is therefore considered as an integrated system of climatic adaptation extending from the settlement scale to the building and material scales. Such an evaluation contributes to the interpretation and contemporary reconsideration of environmental solutions that have developed over a long period within traditional architecture in hot and arid regions.

The study focuses on the architectural and urban characteristics of Ait Ben Haddou and examines its present condition through written, visual, and documentary sources published between 1993 and 2026. The research is based on a literature review, document analysis, and visual-architectural interpretation. Settlement form, spatial organization, street system, building types, and building materials were adopted as the main assessment criteria. The findings indicate that climatic adaptation in Ait Ben Haddou is achieved through the combined operation of a compact settlement pattern, shaded circulation areas, controlled openings, internal courtyards, thick earthen walls, and local construction techniques. It is concluded that principles developed within the traditional settlement—such as shading, the use of natural air movement, high thermal mass, controlled openings, and local materials—have the potential to inform contemporary design in hot and arid regions when they are reinterpreted according to current conditions rather than copied formally.

Keywords: Ait Ben Haddou, vernacular settlement, hot-arid climate, earthen architecture, climate-responsive design.