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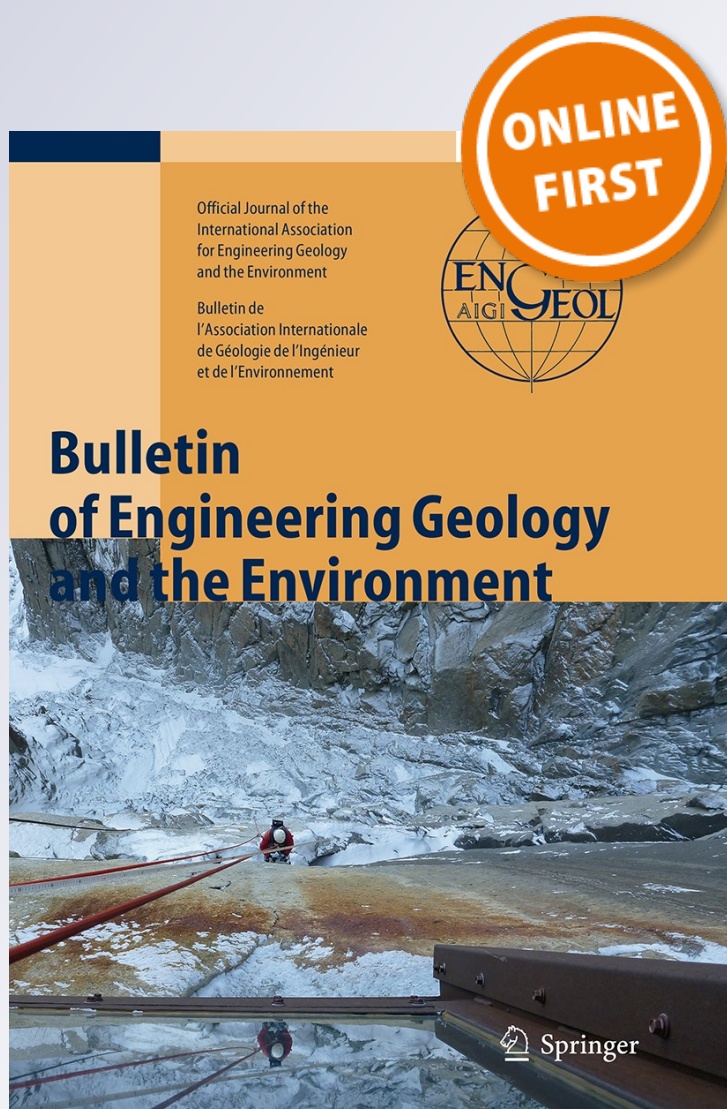
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Soil mineralogical composition effects on the durability of adobe blocks from the Huambo region, Angola

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Abstract After many years of war, great efforts have been made for the socio-economic development of Angola, particularly in the construction industry. Among the construction techniques, adobe is one of the most used in the province of Huambo, especially by low-income families, which constitute the majority. This technique was established as an intangible heritage in the culture of that population. Huambo province is located in the central region of Angola (Central Plateau). Adobe blocks are building elements with potential degradation by the action of water. Due to the subtropical climate, hot and humid, and

geomorphology of the province, located at about 1000–2000 m of altitude and with an extensive river system, these buildings can be vulnerable and may present premature degradation, exacerbated by the lack of knowledge concerning the properties of the geomaterials used and techniques/solutions that allow their stabilization and conservation. This paper aims to present the main results of the study to investigate the influence on adobe performance in regard to the mineralogy and geochemistry of soils used in the production of adobes used in the construction of dwellings. The knowledge gained with this research can support the development of solutions for the common anomalies and problems in this construction, as well as to improve the strength and durability of the adobe units. For this purpose, soil samples were collected and mineralogical, geochemical, and physical tests were performed. Durability and erodibility tests were also performed on selected adobes, following the Geelong method. The results obtained with this research may contribute to the development of the knowledge concerning this sustainable building solution, which has a strong presence in the province of Huambo and neighbouring regions.

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Keywords Adobes · Mineralogy · Soils · Durability · Traditional construction solutions · Angola

Introduction

Adobe is the most common construction material in the province of Huambo, especially by low-income families, which constitute the majority of the population. This technique is closely associated with the local population and culture. Located on the western coast of Africa, Angola is a country with a total area of 1,246,700 km² and with