

Preface

This book is the result of more than 15 years of fieldwork in the Ceará and adjoining states (Rio Grande do Norte, Paraíba, Pernambuco, Piauí). Its preparation was undertaken in a period characterized by important progress in the knowledge of the geology and geophysics of Northeast Brazil and, more generally, of passive margins, basement areas, and sedimentary basins. New methods such as thermochronology also contributed to give new insights into topics such as denudation rates and long-term landform evolution models, raising up renewed discussions when confronted to more classical (morphostratigraphic) approaches. Having gathered a wide and original set of geomorphic, morphostructural, pedological, and other data from fieldwork and processing of various types of digital data (digital elevation models, satellite images...), the authors had published their results in many separate articles, but they finally felt the necessity of publishing an integrated work, in the form of what appears as the first and unique synthesis on the landforms and landscape evolution of Northeast Brazil.

More than a simple monograph, the authors present a comprehensive geomorphic overview of a large tropical region where they show how deciphering the long-term landform evolution helps in understanding the present set of landscapes and morphodynamic environments. Illustrated by original maps and more than 80 color photos and 3D images, it is centered on an original analysis of landforms and soils in a key area allowing the understanding of long-term to short term geomorphic evolution on the equatorial passive margin of Brazil. This part of the Brazilian “Nordeste” displays stratigraphic landmarks whose interpretation reveals the age and nature of landforms, leading to a reconstruction of the geomorphic history by the means of combined morphostratigraphic and morphopedological approaches. Beyond the role of differential erosion related to moderate post-oceanic opening uplift, the plain and upland landscape reflects a juxtaposition of landform and soil generations related to a shallow basin inversion, the last stages of which occurred in semi-arid conditions since the Oligocene. These results throw light on old debates on models of long-term landform development in platform areas, and also help in evaluating recent models of denudation and burial based on thermochronological methods. As a whole, this work brings new scientific data that further help in

assessing geodiversity of a large territory, particularly on geomorphodiversity (landforms and processes) and pedodiversity aspects (soils and paleosoils). At a finer scale, it may also help in identifying valuable geomorphological sites (or geomorphosites) whose scientific and other values (cultural, aesthetic, ecological...) might justify their integration into the national network of Brazilian geosites. It also helps in identifying the distribution of hazards and risks related to landforms and geodynamics in northeast Brazil.

Landforms and Landscape Evolution of the Equatorial
Margin of Northeast Brazil

An Overview

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