
Preface

This book is a tribute to the Luxembourg Cuesta landscape that inspired so many researchers. It integrates more than 50 years of study on the long and short-term evolution and functioning of the cuesta landscape in central Luxembourg. A landscape that reveals large contrasts in lithology, geomorphology, soils and forest vegetation over short distances. An attractive landscape with a high biodiversity and geodiversity that entices many tourists. It is a showcase for education, both students and laymen. By presenting a scientific overview of the knowledge obtained over these past decades we hope to attract more scientific attention for the area and to inspire students and scientists to explore new pathways of research.

The area of study is part of the north-eastern margin of the Paris Basin, a characteristic cuesta landscape. A beautiful landscape with wide, slightly undulating plateaus under grassland and agriculture, deep river incisions, forested rims and steep sandstone cliffs. In the lower parts of the cuesta, marly strata give rise to more gentle slopes, a rolling landscape with numerous small brooks and mixed land-use.

The area did not only attract the attention of researchers from Luxembourg, such as geologists, soil scientists and hydrologists. It also has been a key study area for physical geographers and landscape ecologists of the University of Amsterdam for more than five decades. The geological diversity and tectonic history of the area provide excellent opportunities to study the interactions between landscape development, hydrology, geomorphological processes, soil formation and forest vegetation at multiple scales. Numerous scientific papers, Ph.D. dissertations and students reports have been published that highlight the cuesta landscape. Over the years, the focus has shifted from the use of traditional field methods and descriptive techniques, towards more quantitative approaches, including field monitoring and digital mapping. Modern research and information techniques, such as remote sensing data in combination with computer modelling, field observations and laboratory measurements, make it possible to maintain high standards in educational and research programs.

The book is organized around three themes that are closely interrelated. The first theme (Chapters 1–5) addresses the *long-term geological, geomorphological and hydrological development* of the Luxembourg cuesta landscape, as well as the scientific historical perspective of research in this area. The second theme (Chapters 6–8) focusses on *the geo-ecological system functioning of the landscape*, including soil development, nutrient

availability and forest ecology. The third theme (Chaps 9 and 10) illustrates the *biological and physico-chemical control of natural erosion processes*, including the impact of fauna and vegetation and the substrate on soil erosion processes. Chapter 11 is a showcase of how *obtained knowledge can be applied*. Chapter 12 presents *impressions of students* whom have been working in the area. In several chapters student work is integrated in the scientific results.

Finally, we would like to thank the forestry departments and local communities for their permission and support and all those that in one way or another contributed to this book.

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