

Chapter 70

Landslides: A Guide to Researching Landslide Phenomena and Processes

Snježana Mihalić Arbanas
University of Zagreb, Croatia

Željko Arbanas
University of Rijeka, Croatia

ABSTRACT

Landslide research is an interdisciplinary field that primarily encompasses scientists from geomorphology, engineering geology, and geotechnical engineering in collaboration with researchers from such fields as geodesy, hydrogeology, geophysics, and many others. This chapter is intended as a resource for researchers interested in landslide engineering and landslide science to acquire a summarized review of research subjects and the state-of-the-art literature. A wide range of landslide topics are presented in the following sections: landslide mapping, landslide investigation, landslide monitoring, landslide hazard and risk assessment, and landslide stabilization and remediation measures. The results of landslide studies have practical applications to society via the avoidance, prevention, and mitigation of landslide hazards and risks. Landslide avoidance and prevention are the primary interests for land-use policies based on landslide mapping, followed by the prediction of landslide processes and their consequences. Landslide mitigation includes the development of engineering technologies for landslide investigation, monitoring, and remediation.

INTRODUCTION

The surface of the earth, both on land and beneath the oceans, continually undergoes modifications by mass movements that operate in response to gravitational forces. Landslides represent one type of these mass movements and describe ‘the

movement of a mass or rock, debris or earth down a slope’ (Cruden, 1991). In this chapter, the term ‘landslide’ will include all types of gravity-caused mass movements, ranging from rock falls and topples and a variety of slumps and slides to flows of different materials. Varnes (1978) provided an idealized schematic presentation that displays the

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