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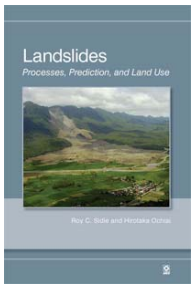
Landslides: Processes, Prediction and Land Use, by Roy C. Sidle and Hirotaka Ochiai, 2006. American Geophysical Union, Water resources Monograph, volume 18. Softbound, vii+ 312 pages. Price list, 40USD. AGU Member price, 28USD. ISBN 0-87590-322-3.



Landslides are natural geomorphic phenomena that play a role in shaping mountainous areas and in redistributing sediments in several parts of the earth's surface.

Landslides are produced by downward and outward movements of slope-forming materials composed of natural rocks, soil, artificial fill or a combination of these. There are slow movements such as soil creep and talus creep, and rapid movements accelerated by water infiltration. Rapid movements include rock avalanches, earth flows, mud flows, debris flows and soil flows. These movements usually take place suddenly with an excessive contribution of infiltrated water. In all cases, the pull of gravity downslope plays a central role. It contributes to the maintenance of the movement of this type of sediment gravity flows until the internal friction of the clasts or the decreasing volume of sediments brings about the final cessation of the flow. In some cases, landslides considerably increase the sediment supply to rivers resulting in a change of their fluvial style. In other cases, natural dams caused by landslides fill some fluvial valleys giving rise to temporary lakes. The fall of these dams often constitute a serious hazard for the population and for the surrounding territory. In the past, humans settled in the most favorable terrains but today owing to rapid population growth new settlements are located in non-favorable and unstable terrains. As a result, these landslides, which are natural processes, could be transformed into natural disasters. Moreover some human activities could exert a crucial influence on the timing and spread of landslides. This book is a significant contribution to our understanding of landslide processes, methods of prediction and effects on land management. Thus, the book is mainly concerned with the relationships between landslide processes and anthropogenic activities.

Land management control is usually carried out by means of remotely sensed data methods and existing thematic maps. Although remote-sensing and GIS processing of data are valuable tools for landslide hazard analysis at larger scales, field work is of paramount importance in assessing the real hazard potential of a region or a site.

Potentially serious errors made in developed countries concerning land management are usually corrected because of the existence of models of land management. By contrast, similar mistakes in developing countries can have tragic consequences given that these countries lack satisfactory territorial plans and economic resources for the reconstruction of damaged infrastructures and for implementing risk mitigation plans.

The volume is divided into seven chapters with numerous case studies that enhance the value and interest of each topic. Chapter 1 (Introduction and overview of landslide problems) deals with the overall significance of landslides; distribution of landslides hazards worldwide; loss of human life; economic consequences; examples of detailed analysis of landslide damages and other environmental impacts. Chapter 2 (Characteristics of various types of landslides) is devoted to classification systems, and broad functional categorization of mass wasting processes. Chapter 3

(Natural factors influencing landslides) focuses on topics such as geological factors; soil engineering, chemical and mineralogical factors; geomorphic factors; hydrologic factors; seismicity and volcanic activity. Chapter 4 (Landslide analysis) considers the analysis of stresses within slopes and initiation, qualifying landslide trigger mechanisms; primary causes of landslides; problems in applying theoretical stability and analysis of natural hillslopes. Chapter 5 (Hazard assessment and prediction methods) is concerned with techniques and methodologies; terrain hazard mapping; simple rainfall-landslide and earthquake-landslide relationships; multifactor empirical landslide hazard assessment; physically based models; overview of landslide hazard assessment and prediction methods. Chapter 6 (Land use and global change) discusses, timber harvesting; roads and other transport corridors; conversion of forests to agricultural lands and plantations; steepland grazing and grasslands ;fire; urban, residential and industrial development; mining, tourism and recreation, and global climate change. Chapter 7 concludes with a general summary of the contents. A section is devoted to the notations used. The list of references contains more than 1300 entries of the most interesting papers published in international peer reviewed magazines. Some of the references correspond to reports to private companies and organizations, some of which are written in Japanese and are included on account of their specific interest. The book ends with an index in the form of key-words.

The book provides fresh insights into landslides and their effects. It throws a considerable light on some complex interrelationships of different factors, natural and artificial ones. Thus, based on empirical evidence the authors assume that landslides are more likely to occur in conditions similar to those of previous failures. Triggering mechanisms such as earthquakes and heavy rainfall can often exert an important effect on the topography, geology, vegetation cover, land use, hydrology and the soil characteristics of a region or locality.

Although the book is relatively small (22.9cm X 15.3cm) it is well written in a light and clear style and is illustrated with numerous graphs and photographs in black and white. The book is a notable contribution to the study of landslides and I warmly recommend it to researchers and advanced students (geologists, civil engineers, ...) and to anyone interested in land management.

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