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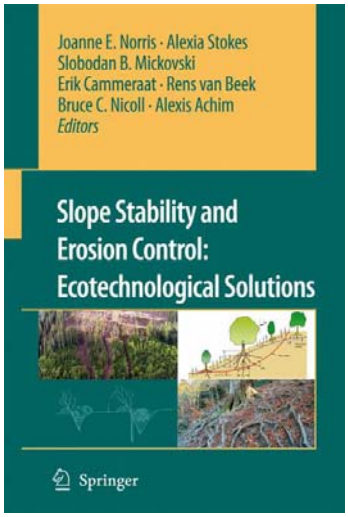

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Slope stability and erosion control: Ecotechnological solutions

This book is designed to assist the civil and geotechnical engineer, geomorphologist, forester, landscape architect or ecologist in choosing ecotechnological solutions for slopes that are prone to a variety of mass movements e.g. shallow failure or erosion. Within this book, the 'engineer' is used in the global sense to encompass all planners, designers, etc. who are involved in the stabilisation of slopes. We review the types of problematic slopes that may occur and describe briefly the nature of mass movements and the causes of these movements. In this book, we focus on the use of vegetation to stabilize soil on slopes prone to mass movements. Before a plant can be chosen for a particular function, its physical and hydrological properties must be determined, thus the root architecture of grasses, shrubs and trees are described and the soil hydrological and mechanical factors which influence vegetation are discussed. Depending on the use of the slope, the engineer may wish to ascertain either the stability of the slope or the mechanical stability of the vegetation or both, therefore slope stability analysis methods are reviewed and the contribution the vegetation has to the stability of the slope are explained. Models to assess the mechanical stability of vegetation are reviewed. This book also introduces new ecotechnological methods for stabilising active rockfalls on steep slopes and slopes that are prone to soil erosion following wild fires, as well as providing user friendly information on traditional ground bio-engineering techniques and tables of plants suitable for different functions. Case studies where ground bio- and eco-engineering measures have been put into practice are also discussed.

Contents: 1. Introduction to Ecotechnological Solutions. 2. An introduction to types of vegetated slopes. 3. Hillslope proceses: mass wasting, slope stability and erosion. 4. How vegetation reinforces soil on slopes. 5. Hazard assessment of vegetated slopes. 6. Species selection for soil reinforcement and protection. 7. Ecotechnological solutions for unstable slopes: Ground Bio- and Eco-Engineering techniques and strategies. 8. Ecotechnological solutions for slope stability: perspectives for future research. Index.

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