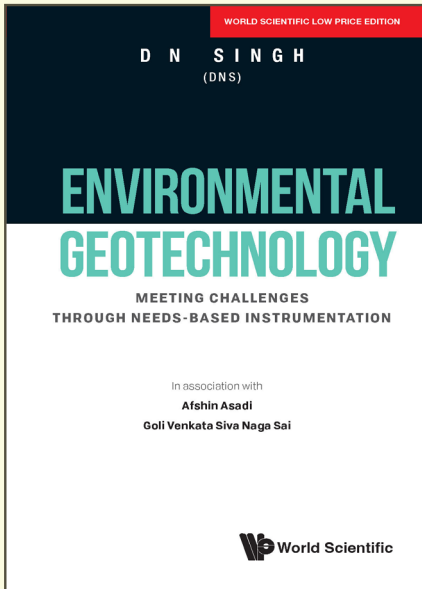


Environmental Geotechnology

Meeting Challenges Through Needs-based Instrumentation



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ABOUT THE BOOK

The rise of rapid and uncontrolled industrialization, its alarming levels of hazardous waste produced, and their negative contribution to the international environmental epidemic of global warming — in addition to the decrease in room to dispose of these wastes safely — have put the pressure for many engineers, researchers, and key decision-makers to find the answers to the constant tussle between progress and sustainability — and quickly.

Environmental Geotechnology revisits existing concepts of geotechnical engineering critically, and brings them up to date with new knowledge and current affairs so as to better address and serve today's needs of the professionals. It points out the role and importance of the parameters and mechanisms that govern the interaction of contaminants with geomaterials (soil and rock mass), and also discusses their degradation in the long-run, and the consequences that follow.

The book starts from an engineering philosophy that incorporates the influence of environmental effects (both manmade and natural) on geotechnical engineering practices. Its contents are based on geotechnical and environmental engineering studies pertaining to waste management, such as: the safe handling, transportation and disposal of waste, the estimation of waste leakage into the subsurface, its consequences, methods of containment, and the development of schemes to remediate contaminated land. It also proposes innovative strategies for waste management through the utilization of wastes based on a comprehensive characterization.

Modelling techniques such as accelerated physical modelling using geotechnical centrifuge, finite-element or difference-based numerical modelling and physico-chemico-mineralogical modelling are discussed in this book to enable the study of the complex (and otherwise slow) process of contaminant-geomaterial interaction.

READERSHIP

Undergraduate and graduate students, research scholars, and professionals working in the field of Environmental Geotechnical Engineering.

CONTENTS

- Introduction
- The Nature of the Environment and Soil
- Conventional- and Neo-Geomaterials
- Geomaterial Characterization
- Geoenvironmental Centrifuge Modelling
- Contaminant Transport in Saturated Soils
- Contaminant Transport in Unsaturated Soils
- Contaminant Transport in Intact Rock Mass
- Heat Migration in Geomaterials
- Response of Geomaterials to Electromagnetic Field

ABOUT THE AUTHOR

Prof. D N Singh (DNS) is associated with the Civil Engineering Department at Indian Institute of Technology Bombay, India. He has obtained Bachelor's, Masters and Doctoral degrees from Indian Institute of Technology Kanpur, India, in 1986, 1989 and 1993, respectively. His teaching, and R&D activities are in quite diversified areas of geotechnical and geoenvironmental engineering. Apart from teaching and research, Prof. Singh has been very actively associated with some of the most prestigious business houses as an in-house instructor and retainer consultant. He has established a state-of-the-art Laboratory for Geoenvironmental Research and Innovation in collaboration with Confederation of Indian Industries, New Delhi. Prof. Singh is Fellow of the Indian National Academy of Engineering (INAE), New Delhi; American Society of Civil Engineers (ASCE); and Institution of Civil Engineers (ICE), London, UK. He also founded *Environmental Geotechnics*, published by ICE Publishing, London, UK, and has been its Editor-in-Chief since its inception. He has also been Editorial Board Member of several journals of repute. Prof Singh is the recipient of the 2003 SP Research Award by SP Foundation, Rolla, MO, USA, and was the Chairman of the 12th International Association for Computer Methods and Advances in Geomechanics (IACMAG) Conference, held in Goa, India. He is the recipient of the Excellent Contributions Award (2008), given by IACMAG to individuals who have a record of significant contributions in research, academic activities and professional service in different regions of the globe; the John R. Booker Excellence Award (2011), given by IACMAG for the advancement of research, education and practice of Environmental Geotechnology and development of novel techniques to simulate contaminant transport in geomaterials, under laboratory and in-situ conditions; the Richard Feynman Prize (2014), for the best paper published by ICE journals; and the Canadian Geotechnical Journal Fredlund Award (2019), for the paper with the highest number of citations among all those published by the journal in previous five years.

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