scientists and other earth scientists with a limited background in soils, and to soil scientists desiring a knowledge of potential research opportunities associated with paleosols. — R. A. DAHLGREN, Land, Air and Water Resources, University of California, Davis, CA, 95616.

Soil and Water Conservation Engineering


Wise use of natural resources in production agriculture and management of environmental quality depends heavily on engineering design of soil and water conservation practices and structures. This hardcover book, as with previous editions, addresses all aspects of soil and water conservation engineering. In this fourth edition the text has been updated and recent references added to the bibliography. Except for certain maps and illustrations, English units have been converted to SI units. The book is designed for use as a text for agricultural engineering students. However, principles and analytical solutions to problems are presented in a manner that is understandable and useful to a wide range of professionals in natural resource research and management.

The first chapter provides an overview, discusses conservation and the environment, and presents supporting data on problems and opportunities in soil and water conservation and pollution control. Chapters 2 through 4 cover agricultural hydrology; chapters 5 through 8, soil erosion and its control; chapters 9 through 11, conservation structures, farm ponds, earth dams, and flood control; chapters 12 through 15, surface and subsurface drainage; chapters 16 through 21, principles and methods of irrigation, including brief discussions of groundwater hydrology and irrigation water quality. Commonly used engineering formulas and coefficients are provided in appendixes, along with a brief listing of computer programs and models used in soil and water engineering. The listing of software is not intended to be comprehensive or necessarily current because of rapid changes in modeling and computer technology; however, adequate examples are provided.

The book should be a valuable reference for researchers in environmental quality, particularly for those conducting field research on transport of sediment and other pollutants. The three chapters on hydrology covering precipitation measurement and analysis, infiltration, evapotranspiration, and factors affecting runoff provide a concise, readily understood reference. — R. A. LEONARD, USDA-ARS, Southeast Watershed Research Laboratory, P. O. Box 946, Tifton, GA 31793.

The Persisting Ecological Constraints of Tropical Agriculture


Tropical land management is now a worldwide concern, mainly in relation to preserving the forest and biodiversity, but also in relation to agriculture, in many ways more often connected to preservation than to the production end. We have all been made aware of the present low productivity and sustainability of many tropical agricultural systems. While some believe that low productivity problems can be overcome in a sustainable manner through research and technology transfer at one level, and the implementation of sound policies on another level, others are tempted to condemn tropical agriculture and demand the return of the forest. This book belongs to the latter trend, and it aims at establishing if the right way to go live with this very marked tendency, the book is a challenging and well-researched piece of work, and deserves to be studied, particularly by experts involved in improving tropical agriculture, in order to be reminded of what they are doing wrong or what is being said about it.

The book was written by two geographers, with the objective of passing "on to the interested non-experts, in the form of substantial but easy-to-follow deductions, the findings that experts of the various geosciences have arrived at in the course of the last three decades" (p. xi). The authors establish very early (p. 5) two theses to which the entire book is dedicated to prove, particularly the first one.

The first thesis relates to the humid tropics: "... even with the application of modern agrotechnics, it is not possible at the scale of normal farm units to replace the extremely biomass-rich forest by continuous and fertilizer-intensive cropping systems for the production of cereals or tubers as man's main staples." The second thesis refers to the semihumid and semiarid outer tropics, and it is more hopeful: "... Their peculiar disadvantage is conditioned by the region-related problem of developing suitable water management systems and irrigation in order to bridge the seasonal dryness ..." After that, the emphasis is placed on the humid tropics, and the basis of such thesis (also termed ecological disadvantage) is the low cation exchange capacity (CEC) of soils in the humid tropics and, secondarily, the high amounts of rain and the frequent occurrence of intensive downpours, the relative difficulty in obtaining lime, and the rapid decomposition of organic matter. The authors even get to postulate that this ecological disadvantage (mainly low CEC values) "is of such magnitude that it suffices to explain the historically documented North-South disparity more convincingly than all socio-economic reasoning" (p. 5). I believe nonexperts will have a hard time judging whether these statements and the proof provided are a complete or a biased view, and, as such, the book becomes a challenge for experts and a convincing argument for nonexperts.

But the bias is not so much that the authors have a point of view, and stress it throughout the text. Nor is it that two geographers discuss complex agricultural and social issues while referring to them as geosciences. The bias is that the authors failed to apply the very basic Popperian principle that demands a good try at disproving the hypothesis, not just a try at proving it. In consequence, they conclude that "it is not possible to turn the return of the forest. This book belongs to the latter trend, and it aims at establishing if the right way to go live with this very marked tendency, the book is a challenging and well-researched piece of work, and deserves to be studied, particularly by experts involved in improving tropical agriculture, in order to be reminded of what they are doing wrong or what is being said about it.

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