
This book is one in a series of twenty books in the Advances in Soil Sciences series written by the same editors. Dr. Lal is Professor and Director of the Carbon Management and Sequestration Center at The Ohio State University in Columbus, Ohio. Dr. Stewart is Professor and Director of the Dryland Agricultural Institute at West Texas A & M University, Canyon, Texas. The book has eighteen chapters that are contributed by over fifty international soil scientists. Each chapter has extensive lists of references to document information in the text.

In the Preface, the Editors note that urban soils are geological materials and have been altered drastically by anthropogenic activities. They explain that in general urban soils are not favorable to plant growth due to compaction and contamination. The book addresses the poor quality and presents discussions of food production in and restoration of urban soils. A brief review of the topics of each chapter is presented.

The first chapter written by Professor Lal presents a brief history of urbanization and notes that the Twenty-First Century is in the era of urbanization with over half of the world population living in urban centers and with most of the growth occurring in developing countries. The chapter presents statistics on population growth and land area of ten large cities in the United States and twenty large cities in the World. The environmental effects of urbanization and the management of urban ecosystems are discussed in several paragraphs.

The second chapter addresses mapping of urban soils and is written by contributing authors. The chapter introduces the US Soil Survey Program and its application to urban soils. Specific surveys include Cook county (Chicago), Los Angeles county, Detroit (Wayne and several counties), and New York City (several counties). Tools for urban mapping including X-ray fluorescence, ground-penetrating radar, and electromagnetic induction are introduced for assessing environmental quality of soils. Recent advances in soil taxonomy of anthropogenic soils and interpretations of soil data are discussed.

A number of contributed chapters on soil organic carbon follow the chapters on soil surveys. Chapter 3 reviews the effects of urbanization on soil organic carbon contents. The region of Moscow, Russia, receives considerable attention. Changes in soil organic carbon with time are discussed. Chapter 4 addresses how anthropogenic factors, called drivers, affect accumulation of soil organic carbon in urban landscapes. These drivers may have indirect effects on soil organic carbon through changes in the climatic and chemical environment of urban areas and the spreading of nonnative plants and animals into the areas. Direct drivers are human activities that transform soils and include land use and management, topsoil removal, soil compaction, and impervious surfaces and pipe systems. Chapter 5 covers soil carbon and nitrogen cycling and a term called ecosystem services, which in this context include nitrogen retention and carbon sequestration. Cycling of organic carbon in urban soils in residential land use in comparison with native prairies, agricultural lands, and forests is discussed. Similarly, the inputs and retention of nitrogen in urban ecosystems are contrasted with rural environments and related to the carbon cycles in different systems. Chapter 6 covers the storage of carbon in urban soils and research into this topic. The effects of climate, parent material, time, vegetation, and anthropogenic activities are presented briefly along with relationships of soil organic carbon to soil classification and properties.

The next series of contributed chapters address difficulties in management of urban soils from physical and ecological standpoints. Chapter 7 covers the sealing of soils with an impermeable layer and assessing how this action affects urban soils. Soil sealing is essentially irreversible and is one of the most damaging processes to affect urban soils. Topics include the impact of sealing on chemical, physical, and biological properties of soils. Chapter 8 deals with toxic chemical elements and organic pollutants in soils and with the risks that these contaminants impart to urban soils. Chapter 9 discusses hydrological properties that result in urban soils from the transformation of land from vegetative landscapes into urban landscapes. The chapter discusses how these properties are imposed in urban landscapes and how adverse conditions might be alleviated. Production and utilization of human-produced wastes in urban areas are topics of Chapter 10. Attention is given to making soils from urban wastes as a means of managing the wastes and improving urban farming and landscaping.

Several chapters address conditions that are not precisely urban or involving soils. Land in roadways along highways have soils that have been disturbed by anthropological activities. Chapter 11 gives an overview of soil conditions in roadways through case studies and presentations on physical, chemical, and biological properties of the soils. Ecosystem services is a term that is appearing in various publications, including this book. Chapter 12 helps to give meaning to this term and to how these benefits may be derived from urban soils. Rooftop farming in urban areas is considered as a way that crop production can occur in land that is covered by building. In Chapter 13, issues of soil or media for rooftop farming and runoff are addressed, and case studies are presented. Chapter 14 gets back to the topic of urban soils with a presentation food production in soil-based agriculture. Perhaps, this chapter could be a concluding chapter in the text. Crop production indoors with hydroponics with multiple elevations of crops (vertical farming) is the topic of Chapter 15. This topic does not involve soils but is viewed as a way of increasing crop production in urban areas on a year-round basis.

Chapter 16 deals with soils and waste management in India. It seems that this chapter would fit well in the group of earlier chapters that address waste management. Chapter 17 covers awareness of the importance of urban soils. It covers discussions of increasing this awareness through various research and educational initiatives. It also could have been in the group of introductory chapters.

The last chapter is written by Professor Lal and is a concluding chapter that summarizes the contents of the book and notes the importance of management of urban soils in feeding of the growing number of inhabitants of large cities.

The book is a comprehensive presentation of the use, properties, and management of urban soils. It presents many facts about urban soils and rural soils. The content is directed toward a large group of readers with English that is easy to understand with minimal use of ecological or agronomic jargon. Acronyms are used extensively, sometimes being defined only once early in a chapter, and readers may spend some time identifying these terms. The purpose of the Appendix is not clear. The book has an index that is likely to be used by readers after they have read the book and want to find content that they have consulted.

The book will be of great value to crop scientists and environmental scientists, who want a comprehensive presentation of diverse topics about urban agriculture.

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