
Preface

In an account of Forest Soils (Chap. 147, Encyclopedia of Soil Science by Ratan Lal, published by CRC Press in 2005), Nicholas B. Comerford asked “Why study forest soils? If there is a subdiscipline called forest soils, why not study corn or tomato soils?” He replied himself by saying that studying forest soil science is justified because “a long-lived forest cover imposes a unique set of characteristics in which it grows”. He further argued that “soil characteristics and processes important to the forest soil scientists are not of great concern to cropland soil scientists for whom the biological and economic time frames of food production are relatively short”. Forest soil characteristics are not only unique but their interpretations are also different. A dense and thick vegetative cover, a continuous forest floor, very deep root systems, long duration (centuries for natural forests; decades for man-made forests) of occupancy of site, and natural succession of vegetation and soil as a coupled system make forest soils a distinctly different entity. For example, we do not get a good crop harvest from a poorly fertile soil unless we add adequate fertilizers to an agricultural soil, but very productive tropical rainforests often can occur in poorly fertile Oxisols and Ultisols. Consideration of both native soil fertility and nutrient recycling may better give a projection of the forest site quality and productivity.

Forests cover almost one-third land area of the world. Scientific investigations of forest soil properties have also been considerable in Europe, America, and the former USSR. But I could find only a few books on forest soils when I had to deliver lectures on the subject to my second semester B.Sc. (Hons.) students in the Institute of Forestry and Environmental Sciences as a guest faculty during 1990s. The following books were very good books of soil science for foresters: *Forest Soils and Forest Growth*, S. A. Wilde (1950) Chronica Botanica Co.; *Forest Soils: Properties and Processes*, K. A. Armonson (1977) University of Toronto Press; *Properties and Management of Forest Soils*, William L. Pritchett and Richard F. Fisher (1987) Academic Press (latter edition *Ecology and Management of Forest Soils*, Richard F. Fisher and Dan Binkley 2000, 3rd Edition, Wiley), but I felt the necessity of a good book on forest soil science that would meet the requirements of general soil, forest soil, and environmental scientists.

Several dozens of good books are available on agricultural soils probably because agricultural soils are related to our food security, agricultural crop lands are intensively managed systems and farmers often find problems in their management. Now-a-days, forest plantations, particularly those for biomass energy production, are also being intensively managed with weeding, thinning, irrigation, and fertilizer addition. Good management without being well acquainted with the resource base is not possible. Forests are also useful in the context of global climate change adaptation and mitigation. These views inspired me to write this book *Forest Soils: Properties and Management* suited to students of soil science, forestry, and environmental sciences, and professionals of related disciplines. It has ten chapters. Chapter 1 gives background information on pedology. It will familiarize readers, may be even non-soil people, with the origin and development of soils. Chapters 2, 3 and 5 describe physical, chemical, and biological properties of forest soils and their impacts on forest vegetation. Chapter 4 narrates forest soil organic matter. Nutrient dynamics in forest ecosystems are explained and elaborated in Chap. 6. An account of soil classification systems of the world and a description of the types of soils in different forest types of the world are given in Chap. 7. Forest soil degradation due to natural and human induced forest disturbances is discussed in Chap. 8. Chapter 9 presents the relationship between forest soil quality and climate change. Forest management

and silvicultural treatments related to seedling development, site preparation, planting, tending, weeding, fertilization, and irrigation and their effects on soil and environment have been discussed in considerable details in Chap. 10.

For last 20 years, I taught forest soils to undergraduate students of Soil Science and Forestry and Environmental Sciences. The general outline of the preset book has been tested on these students during this period. I am grateful to my students. Their reactions and responses inspired me to shape this book. I tried to incorporate recent information and I hope this book will be helpful to foresters, forest managers, environmental experts, and students.

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