

Preface

Biodiversity or biological diversity refers to diversity in the genes, species, community of species, and the ecosystem. Biodiversity includes all living forms on earth. Biodiversity encompasses genetic, species, and ecosystem diversity. Genetic diversity represents the heritable variation within and between populations of a species. Biodiversity is essential for the survival of a species in a changing environment. Climate change creates a new challenge for biodiversity conservation. Species ranges and ecological dynamics are already responding to recent climate shifts, and current reserves/parks will not continue to support all plant/tree species.

Forests cover approximately 31% of the world's total land area, of which 93% is natural forest and only 7% are planted trees. Forest decline is progressing at an alarming rate worldwide. In addition to human activities (logging, deforestation, and forest lands for agriculture and industrial use), a number of other diverse factors, including pests and diseases, drought, soil acidity, radiation, ozone, are cumulatively contributing to global forest decline. The present situation forces us to focus on forest conservation strategies for the present and future. Gene conservation and maintaining of genetic diversity in the forest ecosystems are crucial for the preservation of forest genetic resources. This calls for integrated action for in situ (on site) preservation of forest stands and ex situ (away from the original site) strategies for the conservation of woody plant genetic resources. Selected priority areas include: (1) assessing patterns of genetic diversity and threats, (2) understanding biological processes regulating genetic diversity, (3) assessing the impact of human activities and climate change on genetic diversity, and (4) finding methods to prioritize species and populations for the conservation of forest tree genetic resources. Chapters in this volume are written by leading scientists in their fields of specialization that include woody plant diversity, ecology and evolution, assessment of genetic diversity in forest tree populations, conservation planning under climate change, in situ and ex situ strategies, including biotechnological approaches, in a number of diverse and economically important woody plant species for the conservation of their genetic resources.

This volume provides complete, comprehensive, and broad subject-based reviews for students, teachers, researchers, policy makers, conservationists, and NGOs interested in the field of biodiversity and conservation of woody plants.

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Biodiversity and Conservation of Woody Plants

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2017, XII, 511 p. 83 illus., Hardcover

ISBN: 978-3-319-66425-5