

REVIEW

H. LIETH & M.J.A. WERGER (Eds.): Tropical rain forest ecosystems, Biogeographical and ecological studies. Volume 14B of the series *Ecosystems of the World*, editor in chief David W. Goodall. Elsevier, Amsterdam-Oxford-New York, 1989, XVII + 713 pp., incl. author, systematic and general indexes. Price Dfl. 285.00. ISBN 0-444-42755-4.

This book is sequel to Volume 14A, *Tropical Forest Ecosystems, structure and function*. Whereas the first volume deals with system ecological aspects such as community organization and processes, the present volume concentrates on biogeographical aspects such as species composition, diversity, and geographical variation. Recent ecological research in the tropical rain forest has greatly extended our understanding of biogeographical patterns on variation in the various groups of organisms and has revealed many of the ecological and evolutionary forces that led to the present patterns of variation. Many important systems of co-evolution between the tropical rain forest ecosystems have also come to light, and the loss of species and related damage is better understood in quantitative terms. This volume presents a comprehensive review of these and other features of the rain forest ecosystem structure and the ecological processes operating that system. General chapters on abiotic and biotic factors are followed by specific chapters on all major groups of organisms. Prospects of the future are discussed and research needs clearly stated. Also the human exploitation of the system, its effect and its limits are discussed. The book is extensively illustrated and comprehensive bibliographies follow each chapter. It is of the greatest value to all people who study the tropical rain forest as well as for nature conservationists and planners dealing with tropical areas. Among the authors we find the world's most outstanding experts on the subjects, like Gillean Prance, Peter Ashton, Tim Whitmore, Eberhard Bruenig, Rob Gradstein, Norman Myers, Kuswata Kartawinata and many others. There are 35 chapters.

To discuss the whole book critically would take many pages, therefore I restrict myself to a few examples. The chapters 33, the exploitation of the African rain forest and man's impact, by R. M. Lawton, chapter 34, exploitation in southeast Asia, by K. Kartawinata et al., and chapter 35, use and misuse of tropical rain forest, by E. F. Bruenig, contain much overlap as well as difference of opinion on the subject of sustainability of exploitation. Whereas Lawton states that "the forests reserves must be managed for the production of a sustained yield of valuable timber trees and not treated as a wasting asset", Kartawinata et al. cite Ashton: "a sound ecological basis for selective logging has never been established, and it will rarely be successful ..." and Awang: "too many unknowns bear on the exploitation system." Bruenig argues that "Timber and fuel wood harvesting in the humid tropical forest make little contribution to deforestation. Well planned and cautiously executed selective timber exploitation will not destroy the viability and regenerative vigour of the mixed rain forest ecosystem." All authors agree that careless operating, over-mechanization, and the use of excessively heavy machinery is detrimental to the forest ecosystem. But except for a citation by Bruenig ("De Graaf considered natural silviculture with a cautious girth-limit selection and low cost silvicultural treatment to be economically viable") none of the authors discusses the economic viability of a low intensity exploitation with current timber prices. As it is not clear yet how many trees per hectare can be cut not using heavy equipment without at least changing and sometimes damaging the ecosystem, much more emphasis should be laid on conservation and research. Relevant sources from Southeast Asia argue that before the end of the century the dipterocarp forests will be commercially depleted, and vast areas of former rain forest damaged to such a degree that regeneration will take centuries if it will take place at all. The statement of Bruenig that timber cutting makes little contribution to deforestation should be changed to the effect that – in Southeast Asia – timber cutting often leads to destruction of the primary forest ecosystem.

H.P. NOOTEBOOM