

Plantation Forestry In The Tropics The Role Silviculture And Use Of Planted Forests For Industrial Social Environmental And Agroforestry Purposes

Development of planted forests in tropical and subtropical countries is accelerating to satisfy the ever-growing global demand for wood products. It is expected that within 20 years half of all wood fibre in the world will be sourced from plantations, of which more than half are in the tropics and subtropics. Active community involvement in tree planting as part of rural development is now widespread and welcome. Plantation Forestry in the Tropics provides an overview that sets plantation silviculture in the wider context of development processes and their social, environmental and ecological impacts. The structure and approach of previous editions have been retained but every chapter has been comprehensively revised and updated. Two new chapters, one on clonal forestry, the other on ecological restoration, have been added.

Eucalypt plantations in the humid tropics. Eucalyptus plantations in the equatorial zone, on the coastal plains of the Congo. Eucalypt and pine plantations in South Africa. Plantations of *Eucalyptus urophylla* S.T. Blake. *Acacia mangium* plantations in PT Musi Hutan Persada, South Sumatra, Indonesia. Eucalypt plantations in Monsoonal tropics - Kerala, India. Eucalypt plantations in South-

Western Australia. Pine plantations on the coastal lowlands of subtropical Queensland, Australia. Chinese fir plantation in Fujian Province, China.

This book presents a synopsis, with an innovative approach, of abundance, types and conditions of work performed in the tropical plantation and natural forests. It covers work of formally and informally employed, and of own-account small-scale forest users, women and children. Activities in tree harvesting are analyzed, also on-site conversion by pitsawing, planting and pruning. The abilities of the workers and their efforts while fulfilling their tasks, resulting in performance and workload, are described with many examples of published studies. Influencing variables from organizational, technical and managerial sides are considered as much as included in the studies. The detailed descriptions demonstrate the methodical state of ergonomic research. For better understanding of the coverage the background of the development of forest work science is described. The lasting influence of Taylorism and the roles of ILO and FAO as well as NGOs, e.g. in certification, are pointed out.

The First Fifty Years

The Basis for Conservation and Management

Secondary Forest Management and Plantation Forestry

Technologies to Improve the Use of Converted Tropical Lands

Commercial plantation forestry

Plantation Forestry in Guanacaste, Costa Rica

Environmental Concerns

This book provides a cross-section of all outstanding experience in all fields of tropical forestry under a drastically changing environment induced by climate change. It sheds light on the existing know-how and presents it in a concise and efficient way for the scientist and professional in charge of planning, implementing and evaluating forest resources. The Tropical Forestry Handbook provides proven and/or promising alternative concepts which can be applied to solve organizational, administrative and technical challenges prevailing in the tropics. Presented are state of the art methods in all fields concerning tropical forestry. Emphasize is given to methods which are adapted to- and which safeguard - environmental conditions.

Based on thorough bibliographic research of a highly controversial topic, this report, jointly sponsored by IUCN, UNEP and WWF, shows the potential of plantations, while also exposing problems which may arise if massive tree plantations proposed for the tropics are to be established. Major issues covered include; species selection, soil and water cycle effects, fires, pests and diseases, effects on biodiversity, carbon dioxide fixation, land tenure and social issues, and plantation economics. Some broad conclusions and guidelines to be considered when establishing large scale plantations in the tropics complete this study.

The area of forest plantations in the tropics has increased for many reasons, but not the least as a result of natural forest depletion. Although forest plantations cannot qualitatively substitute the timber grown in natural forests, their importance in global forestry is steadily increasing. At the same time a heated public debate has been growing with them, focusing largely on the perceived negative environmental and social impacts of large-scale industrial plantations. This research report first discusses tropical plantations in global forestry. It emphasizes that tree plantations presently include a much wider range of categories, purposes, species variety and management forms than is commonly perceived. The study states that although industrial forest plantations are mainly established solely for economic reasons, private farm-forestry and governmental plantations more often have a variety of reasons for establishment. These reasons include expectations for positive social and environmental impacts of forest plantations, e.g. increased household security and soil conservation. Nevertheless the environmental and social impacts of plantations deserve much concern and the second part of the study widely reviews environmental and social but also economic impacts of plantations, all of which can be either negative or positive. One of the major problems in developing plantation forestry has been that the profitability analysis of plantations

has based only on the economic criteria. Although financial profitability can be regarded as the most important single evaluation criteria for forest plantations in the tropics, the negative and positive social and environmental impacts should also be attempted to be included into the analysis. The focus of the empirical part of the work, therefore, has been to study to what extent it presently is possible to monetize the varying impacts of tree plantations and incorporate them into the "multilevel" profitability analysis. In two case study countries, Thailand and the Philippines, the profitability of industrial, community based and private reforestation was assessed for two most commonly used tree species in reforestation. The profitability assessments were aimed to be carried out at four different levels: based on comparisons between costs and benefits in market prices (financial profitability), economic efficiency prices (economic profitability), economic efficiency prices with the distributional weight assessments (socio-economic profitability), and finally with including monetary valuation of environmental impacts into the economic analysis (environmental-economic profitability). For the environmental-economic profitability, the study evaluated the economic costs of transpiration and nutrient loss in harvesting, and benefits in erosion control and carbon sequestration. The results of the two case studies indicated that the economic

profitability of reforestation is considerably higher than the financial profitability both in Thailand and the Philippines. It also became evident that the environmental-economic profitability was highly dependent on the environmental impact and valuation assessments; in this study, the environmental-economic valuation improved the economic profitability of reforestation. A conclusion derived from the socio-economic analysis was that the return to labour per hectare is very low in mechanized reforestation. The empirical basis of including environmental and social impacts into traditional profitability analysis of tree plantations requires much improvement and the work done still carries a character of methodological experiments. Nevertheless a conclusion is evident: if the social and environmental costs and benefits, evaluated in monetary terms, could properly be included into the solid framework of economic analysis, that would further encourage for environmentally and socially sensitive management practices in plantation forest development.

Tropical Forest Ecology

Tropical Forestry Handbook

Plantation Forestry in the Tropics

Plantation Forests and Biodiversity: Oxymoron or Opportunity?

Tree Plantations in the Philippines and Thailand

Planted Forests: Contributions to the Quest for

Sustainable Societies

This new edition has been completely revised to provide up-to-date accounts of silvicultural practices, rural development issues, and the wider role that tree-planting plays. The chapters on agroforestry and protection forestry have been virtually rewritten, while throughout the book the important place of social forestry is recognized.

Importance of tropical forests;
characteristics of tropical forests;
classification of tropical forests;
deforestation in the tropics; management
of tropical forests; plantations and
agroforestry systems; approaches for
implementing sustainable management
techniques.

Large numbers of tropical trees from natural forests or plantation forest are available for human consumption and management. This book focuses on the prospects and utilization of tropical plantation trees in context of economic and business, planting, managing stocks, and uses of trees converted to various wood-based products. It provides information on key areas of tropical plantation trees including growth performance, nursery practices, soil properties, planting stock production, raw

material cellulose, anatomy, pulping and papermaking, fiber modification, and properties of wood composites. Features: Comprehensive information on prospects and utilization of tropical plantation tree species. Features information on potential products derived from tropical plantation trees including cellulose-based wood products, particleboard with bioplastic binder, and laminated veneer lumber. Discusses species usage of economic importance other than wood production. Presents information on nursery practices, growth performance, and soil properties of tropical trees. Illustrates methodologies for repeating investigations on work that has been done previously in tropical tree research. This book introduces information for entrepreneurs or researchers before undertaking work with these tree species illustrating technical methodologies allowing for repetition or previous successful works. This information proves valuable to researchers if further work is needed for improvement on these plant-derived products.

Plantation Technology in Tropical Forest Science

Tree Planting in for Industrial, Social, Environmental, and Agroforestry Purposes
Management of Tropical Plantation-forests

and Their Soil Litter System

The Jari Experience

Tree Planting for Industrial, Social,
Environmental, and Agroforestry Purposes
Ecosystem Goods and Services from
Plantation Forests

1 Plantation forests and biodiversity: Oxymoron or opportunity? Forests form the natural vegetation over much of the Earth ' s land, and they are critical for the survival of innumerable organisms. The ongoing loss of natural forests, which in some regions may have taken many millennia to develop, is one of the main reasons for the decline of biodiversity. Preventing the further destruction of forests and protecting species and ecosystems within forests have become central issues for environmental agencies, forest managers, and governments. In this difficult task science has an important role in informing policy and management as to how to go about this. So how do industrial and other plantation forests fit into this? Plantation forests, comprised of rows of planted trees that may be destined for pulp or sawmills after only a few years of growth, appear to have little to contribute to the conservation of biodiversity. Yet there is more to this than meets the eye (of the casual observer), and there are indeed numerous opportunities, and often untapped potential, for biodiversity conservation in plantation forestry. With plantation forests expanding at a rate of approximately three million hectares per year, it is

crucial to understand how plantations can make a positive contribution to biodiversity conservation and how the potentially negative impacts of this land use can be minimised. That is the topic of this book.

This book is intended to be a record of the Biotechnology-Assisted Re/Afforestation Project in the Asia-Pacific Region (BIO-REFOR) since 1992, conducted in cooperation with the International Union of Forest Research Organizations (IUFRO). The purpose of the project is to promote exchanges of information of fundamental research on indigenous species in the Asia-Pacific Region in order to restore natural forests. The production, cultivation, and maintenance of forest tree species provide highly sustainable production systems that conserve soils, the microenvironment, and biodiversity. The key technology for biomass production of forests is propagation via micropropagation or traditional propagation. However, there are many recalcitrant species among useful forest trees to be propagated in large numbers. Recent advances in mycorrhizal technology and in vitro culture have made it possible to commercially propagate useful trees for re/afforestation. In this book, comprehensive information is provided on propagation, mycorrhizal inoculation, and reforestation of economically and environmentally important forest trees, information that usually is available only in widely scattered resources. Here, we include a wide area

of the ecology and physiology of dipterocarps as a general overview, and then cover propagation techniques, mycorrhizal symbiosis, man-made forests, and biodiversity in the Asia-Pacific region. Planted forests, from irrigated eucalypts in Brazil to Douglas-fir seedlings in the mountains of Oregon, are described and discussed by international experts. The varieties, purposes, forms, and ecological, economic and social aspects of planted forests are considered in technical details and in case studies from temperate and tropical regions of the world.

Insect Pests in Tropical Forestry

Planted Forests

Forest Plantations for Sustainable Production in the Tropics

Litter, Biota and Soil-nutrient Dynamics

Plantation Forestry in Relation to Tropical Moist Forests in South East Asia

Encyclopedia of Forest Sciences

This book brings together recent advances in the research on the ecological functioning of the soil litter system of tropical plantation forests in relation to their management, which is of crucial importance for the growth of trees and sustainability of the ecosystem. This book includes contributions from internationally renowned researchers in the field, synthesizes considerable body of research available and provides adequate reference at the end of each article (chapter) for further reading. It should be of great value to and a resource book for environmental biologists, ecologists, soil biologists, soil scientists, plant ecologists, plantation managers, forest conservators, and many others with

an interest in the tropics.

The representative plantation. Forest planation simulation model.

Extramodel factors affecting investment in industrial forest

plantations. Model results: base case. Implications of the results.

Ecological implications of tropical plantation forestry.

Representative plantation regimes: costs and yields. Mathematical

formation of the model. International transport cost

methodology. Stumpage prices.

Plantations for the tropics their, extent and nature. Genetic

resources for plantation forestry. The biophysical environment.

Soils of the tropics and their management for plantation forestry.

Hydrology of forest plantations in the tropics Dynamics of leaf and

canopy development. The ecophysiological basis for productivity

in the tropics. Roots and Mycorrhizas in plantation ecosystems.

Nitrogen fixation in tropical forest plantations. Dynamics of

nutrient supply in plantation soils. Soil and stand management

for short-rotation plantations. Stand development and

productivity. Organic matter accretion, decomposition and

mineralisation. Reforestation of salt-affected and acid soils.

Towards sustained productivity and acid soils. Towards sustained

productivity of tropical plantations: science and practice.

The Comparative Economics of Plantation Forestry

Site Management and Productivity in Tropical Plantation Forests

Tropical Forest Plantation Resources

Plantation Politics

Institute of Tropical Forestry

Plantation Forestry in the Amazon

Tropical countries are expanding plantation forestry to develop

sustainable wood production systems. Much of this is based on

short rotations of exotic species. These systems require large

capital investments represent intensive land use and increase the

demands on the soil. To develop options for maintaining or increasing productivity, a partner-project was initiated by Center for International Forestry Research (CIFOR) with three objectives: 1) evaluate the impact of soil and site management practices on the productivity of successive rotations of plantations, 2) develop management options for maintaining or increasing productivity and 3) where it is appropriate strengthen local institutional capacity to respond to new problems and opportunities. The project focuses on the critical inter-rotational phase of management: harvesting, site preparation, and early stand development. A core set of treatments selected to create a range of impacts on organic matter and nutrients supply intensities will be included at all locations. Optional treatments tailored to each site will be added as required by local management, and soil and stand considerations. Each location will carry out a self-contained experiment that will produce scientifically valid results on its own merit. All experiments are networked to integrate the information so underlying processes can be understood and options for science based management developed. All sites are expected to be valuable reference sites for long-term investigations.

Plantation forests often have a negative image. They are typically assumed to be poor substitutes for natural forests, particularly in terms of biodiversity conservation, carbon storage, provision of clean drinking water and other non-timber goods and services. Often they are monocultures that do not appear to invite people for recreation and other direct uses. Yet as this book clearly shows, they can play a vital role in the provision of ecosystem services, when compared to agriculture and other forms of land use or when natural forests have been degraded. This is the first book to examine explicitly the non-timber goods and services

provided by plantation forests, including soil, water and biodiversity conservation, as well as carbon sequestration and the provision of local livelihoods. The authors show that, if we require a higher provision of ecosystem goods and services from both temperate and tropical plantations, new approaches to their management are required. These include policies, methods for valuing the services, the practices of small landholders, landscape approaches to optimise delivery of goods and services, and technical issues about how to achieve suitable solutions at the scale of forest stands. While providing original theoretical insights, the book also gives guidance for plantation managers, policy-makers, conservation practitioners and community advocates, who seek to promote or strengthen the multiple-use of forest plantations for improved benefits for society. Published with CIFOR

Plantations are playing an increasingly important part in the development and the economies of the South. *Plantation Politics* is the first book to examine their rationale and purpose, exposing the misconceptions and myths that have surrounded their role, and describing the contribution they can make to sustainable development. At their best, industrial plantations can become a major asset to local development by providing raw materials, infrastructure, employment, income and environmental and recreational services. At their worst, plantations, usually imposed from a 'top-down' perspective and ignoring local needs, values and rights, have monopolized land in times of food shortage, degraded wild animal and plant populations, and destroyed habitats and landscapes. The contributors analyse the conditions appropriate for both simple and complex plantations, and the contributions each can make. Complex plantations, whether established from scratch or within natural forest, are more

suitable in most cases, where they are subject to numerous different claims and needs. However, their ownership, management and silviculture present new challenges which, without the carefully researched guidelines offered here, current policy and research may well be ill-equipped to take up. Caroline Sargent is the Director and Stephen Bass is the Associate Director of the Forestry Programme at the International Institute for Environment and Development. Originally published in 1992

Economic, Social and Environmental Evaluation
Key Issues for Decision-makers

Tropical Forestry Change in a Changing World

Physical and Biological Potentials and Risks

The role, silviculture and use of planted forests for industrial, social, environmental and agroforestry purposes

The justification of plantation forestry in the Tropics.

Plantation forestry in the study. Land potential in the tropics.

Forest management - its influence on and dependence of the physical land characteristics. Land evaluation and soil management for forestry.

A combination of broad disciplinary coverage and scientific excellence, the Encyclopedia of Forest Sciences will be an indispensable addition to the library of anyone interested in forests, forestry and forest sciences. Packed with valuable insights from experts all over the world, this remarkable set not only summarizes recent advances in forest science techniques, but also thoroughly covers the basic information vital to comprehensive understanding of the important elements of forestry. The Encyclopedia of Forest Sciences also covers relevant biology and ecology, different types of forestry (e.g. tropical forestry and dryland forestry), scientific names of trees and shrubs, and the applied, economic, and social aspects of forest management.

Valuable key features further enhance the utility of this Encyclopedia as an exceptional reference tool. Also available online via ScienceDirect - featuring extensive browsing, searching, and internal cross-referencing between articles in the work, plus dynamic linking to journal articles and abstract databases, making navigation flexible and easy. For more information, pricing options and availability visit www.info.sciencedirect.com. Edited and written by a distinguished group of editors and contributors Well-organized encyclopedic format provides concise, readable entries, easy searches, and thorough cross-references Illustrative tables, figures, and photographs in every entry, produced in full color Comprehensive glossary defines new and important terms Complete, up-to-date coverage of over 60 areas of forest sciences - sure to be of interest to scientists, students, and professionals alike! Editor-in-Chief is the past president of the International Union of Forestry Research Organizations, the oldest international collaborative forestry research organization with over 15,000 scientists from 100 countries

Planted forests - despite being only seven per cent of the world's forest resources, have superseded naturally regenerating forests as the principal source of industrial wood products. Lessening the pressure for wood production, on natural forests, tree planting has released them to be managed for other purposes - carbon sinks, soil and water protection, conservation of biological diversity, recreation and amenity. Representing a complement, but not an alternative, to natural forests, planted forests have become increasingly important for reducing worldwide deforestation, loss of forest ecosystems and forest degradation. Examining the significance of this rapidly emerging world resource, chapters consider the strengths and weaknesses of

planted forests, management objectives for their use and aspects of ownership and policy. Data from key production countries are used to evaluate the implications and sustainability of planted forests as a source of forest products as well as social and ecological issues.

Work in Tropical Forests

A Global Assessment

Prospects and Utilization of Tropical Plantation Trees

Plantation Forestry in Tropical Countries

Assessment of Extent and Methods for Yield Estimation

Site Management and Productivity in Tropical Forest Plantations

Insects are major pests of both natural and plantation forests in the tropics. This book is the first to provide a broad-based, international review of this subject at a level suitable for advanced students and practitioners. It describes the ecology and biology of the insects with special reference to the economic damage they cause to trees. All relevant control strategies are addressed. It is suitable for students, researchers and practitioners of forestry, ecology, pest management and entomology in tropical and subtropical countries.

Experimental studies. Eucalypt. Acacia. Conifer. Mixed-species. Synthesis.

Management of Soil, Nutrients and Water in Tropical Plantation Forests

Plantation forestry in the tropics and the silviculture of temperate broadleaved woodland

Forest plantations in development

Workshop Proceedings, 16-20 February 1998, Pietermaritzburg, South Africa

Encouraging Industrial Forest Plantations in the Tropics
Report of a Global Study