

## Mangrove Management Assessment And Monitoring

Mangroves are one of the most productive and biologically important blue-carbon ecosystems across the coastal intertidal zone of earth. In the current scenario of serious environmental changes like global warming, climate change, extreme natural disasters, mangrove forests play a vital role in mitigating greenhouse gas emissions and maintaining ecosystem balance. Mangroves are unique ecosystems with rich biological diversity of different taxonomic groups exhibiting great ecological and commercial importance. The book consolidates existing and emerging information on ecology of mangroves, with a special reference to their biodiversity and management. It emphasizes on the role of mangroves in providing various ecological services. The book is a comprehensive compilation covering all aspects of mangrove ecology. It is useful for students and researchers in ecology, plants sciences and environmental sciences.

This document aims to provide an understanding of the scientific methodology that can be employed to demonstrate, monitor and assess mangrove-relevant environmental services by using case studies of mangroves in Hai Phong City and the Can Gio district of Ho Chi Minh City in Vietnam. In addition to previous work, this methodology evaluates the water purification services of mangroves in the context of existing policies on payment for forest environmental services in Vietnam, and discusses lessons learned, and funding requirements for effective assessment, evaluation and monitoring of the service. The findings contribute to identifying users and buyers of mangrove environmental services and developing implementation and monitoring mechanisms for payment for forest environmental services (PFES) through the application of environmental indices. The document is made in the hope that future studies can apply its methodology in other regions of the country to develop a database for evaluating the roles of mangroves throughout Vietnam.

The book *Advances in Environmental Monitoring and Assessment* is a collection of the latest research techniques on environmental monitoring and assessments. I believe that the information contained in this book will enhance the skills of environmental scientists and decision makers and contribute to the exchange of best practices for developing and implementing optimum methods for environmental assessment and management.

This book is the sixth and final volume in the *Tasks for Vegetation Science* book series, and it concludes the most comprehensive scientific documentation dealing with hypersaline ecosystems of the world.

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.

This publication provides a timely synthesis of the importance of mangroves to people. It highlights that in spite of the mounting evidence in support of the multitude of benefits derived from mangroves, they remain one of the most threatened ecosystems on the planet, being lost at a rate greater than coral reefs and tropical rain forests. This has potentially devastating effects to mangrove biodiversity and in turn, the food security, protection and livelihoods of some of the most marginalized coastal communities in developing countries, where more than 90 percent of the world's mangroves are found.

This book delves into human-induced and natural impacts on coastal wetlands, intended or otherwise, through a series of vignettes that elucidate the environmental insults and efforts at amelioration and remediation. The alteration, and subsequent restoration, of wetland habitats remain key issues among coastal scientists. These topics are introduced through case studies and pilot programs that are designed to better understand the best practices of trying to save what is left of these fragile ecosystems. Local approaches, as well as national and international efforts to restore the functionality of marsh systems are summarily approached and evaluated by their efficacy in producing resilient reclamations in terms of climate-smart habitat conservation. The outlook of this work is global in extent and local by intent. Included here in summarized form are professional opinions of experts in the field that investigate the crux of the matter, which proves to be human pressure on coastal wetland environments. Even though conservation and preservation of these delicate environmental systems may be coming at a later date, many multi-pronged approaches show promise through advances in education, litigation, and engineering to achieve sustainable coastal systems. The examples in this book are not only of interest to those working exclusively with coastal wetlands, but also to those working to protect the surrounding coastal areas of all types.

World Seas: An Environmental Evaluation, Second Edition, Volume Three: Ecological Issues and Environmental Impacts covers global issues relating to our seas, including a biological description of the coast and continental shelf waters, the development and use of the coast, landfills and their effects, pollutant discharges over time, the effects of over-fishing, and the management methods and techniques used to ensure continued ecosystem functioning. The relative importance of water-borne and airborne routes differ in different parts of the world is explored, along with extensive coverage of major habitats and species groups, governmental, education and legal issues, fisheries effects, remote sensing, climate change and management. This book is an invaluable, worldwide reference source for students and researchers concerned with marine environmental science, fisheries, oceanography and engineering and coastal zone development. Provides scientific reviews of regional issues, empowering managers and policymakers to make progress in under-resourced countries and regions Covers environmental issues arising from the human use of both the sea and its watershed Presents informed commentary on major trends, problems and successes, and recommendations for the future

Mangrove forests existing at the interface between the sea and land in inter-tidal zones in tropical and subtropical areas

playing quite significant ecological, socioeconomic and climate amelioration functions across the globe have been badly degraded over the years due mainly to human factors. Efforts to manage these forests have been widely demonstrated and documented. While mainly undisturbed states of these forests have been studied, relevant information especially on stock and ecosystem responses to human driven factors is often lacking for management applications. Systems of forest assessments and monitoring often applied to upland forests appear inappropriate to these systems with varied multi-stemmed and diverse eco-morphological structure of tree forms. The main objective of the study was to develop appropriate models to facilitate the assessment, monitoring and sustainable management of mangrove forest resources following different wood exploitation pressures in the Central African coastal Atlantic forests of Cameroon. It is a contribution to the understanding of the recovery dynamics and resilience of mangrove systems to various disturbance systems. Results provided are based on data on temporary sample plots and four year observations with two remeasurements intervals on permanent sample plots established in heavily exploited, moderately exploited and undisturbed mangrove forests in the Douala-Edea Wildlife Reserve mangroves in Cameroon Atlantic coast. Tree diameter dependent allometric relationships were developed to guide sustainable exploitation of mangrove forest including height partitioning relationships, stand curves, tree and stand volume equations with their statistical and graphical fit tests. Tree diameter dependent biomass expansion/conversion factor equations or constants have also been developed based on ratios of tree volumes to total biomass obtained from relevant published generic biomass equations with tables prepared from the best mode.

Although the main focus of this book is on the estuaries, its scope goes well beyond this particular coastal feature. Indeed, the estuary can only be considered as part of the life cycle of the entire river and the marine area it feeds into: an area particularly subject to human and natural pressures. The main estuaries and deltas of West and Central Africa region provide a variety of goods and services to its coastal population. The most important of them are related to critical fish habitat, wood and charcoal from mangroves, as well as space for agriculture, aquaculture, urban development, tourism and transport. Particular emphasis has been made in this book on mangroves that play a significant role in terms of flood control, groundwater replenishment, coastline stabilization and protection against storms. They also retain sediments and nutrients, purify water, and provide critical carbon storage. Such hydrological and ecological functions explain the focus on serving mangrove ecosystems and the nearby communities, which draw significant income from fishing, rice production, tourism, salt extraction and other activities such as harvesting honey and medicinal plants, hence the need for preserving mangrove ecosystems to ensure sustainability of the estuaries and deltas of West and Central Africa region. The book has a foreword by Mr. Achim Steiner, United Nations Under-Secretary General and Executive

Director of UNEP who is stating that credible and up-to-date information is essential for the public at large but more specifically for scientists, researchers, managers, decision-makers all working together in order to safeguard, protect and sustainably manage estuaries, deltas and lagoons, and the coastal and ocean waters of Western and Central Africa. "This atlas provides the first truly global assessment of the state of the world's mangroves. Written by the leading expert on mangroves with support from the top international researchers and conservation organizations, this full color atlas contains 60 full-page maps, hundreds of photographs and illustrations and a comprehensive country-by-country assessment of mangroves. Included are the first detailed estimates of changes in mangrove forestcover worldwide and at regional and national levels, an assessment of these changes and a country-by-country examination of biodiversity protection. The book also presents a wealth of global statistics on biodiversity, habitat area, loss and economic value which provide a unique record of mangroves against which future threats and changes can be evaluated. Case-studies, written by regional experts, provide insights into regional mangrove issues, including primary and potential productivity, biodiversity, and information on present and traditional uses and values and sustainable management."--Pub. desc.

Sundarbans, a UNESCO heritage site, is the world's largest single chunk of mangroves distributed on the Indian and Bangladesh coasts. The mangroves and associated ecosystems are one of the most fertile ecosystems of the earth. Sundarbans Mangrove Systems: A Geo-Informatics Approach portrays different perspectives of studying Sundarbans and mangroves using geospatial analysis. This book highlights the major issues with the Sundarbans mangrove forest, its future conservation strategies and its ecological importance using geo-informatics technology. It explains the usage of remote sensing data for providing information about the present state of mangroves and their tropic status, including assessment in terms of extent, density of community, condition, diversity, identifying potential habitats and heterogeneity. Furthermore, it discusses the use of hyperspectral remote sensing data for species level classification of mangroves, community zonation for biodiversity assessment and for preparing management plans for conservation. KEY FEATURES Exclusively covers the ecological state of Sundarbans (mangrove systems) through geo-informatic studies Describes the application of a combination of geomorphological, biogeochemical and remote sensing methods to the analysis of temporal changes Includes environmental factors affecting the health and decline of mangroves Covers biodiversity and ecological controls in mangroves ecosystems Discusses a remote sensing approach for tropical forested island and mangroves mapping This book is aimed at graduate students and researchers in environmental sciences, ecology, marine sciences, biology, geosciences and GIS/remote sensing areas.

Explores how the management of wetlands can influence carbon storage and fluxes Wetlands are vital natural assets, including their ability to take-up atmospheric carbon and restrict subsequent carbon loss to facilitate long-term storage.

They can be deliberately managed to provide a natural solution to mitigate climate change, as well as to help offset direct losses of wetlands from various land-use changes and natural drivers. Wetland Carbon and Environmental Management presents a collection of wetland research studies from around the world to demonstrate how environmental management can improve carbon sequestration while enhancing wetland health and function. Volume highlights include: Overview of carbon storage in the landscape Introduction to wetland management practices Comparisons of natural, managed, and converted wetlands Impact of wetland management on carbon storage or loss Techniques for scientific assessment of wetland carbon processes Case studies covering tropical, coastal, inland, and northern wetlands Primer for carbon offset trading programs and how wetlands might contribute The American Geophysical Union promotes discovery in Earth and space science for the benefit of humanity. Its publications disseminate scientific knowledge and provide resources for researchers, students, and professionals.

This book provides recent environmental, ecological and hydrodynamic information for the major estuaries and the coastal marine systems of the Western Indian Ocean Region. It covers various functions and values of the region's estuarine ecosystems and their respective habitats, including the land/ocean interactions that define and impact ecosystem services. The Western Indian Ocean region covered by this volume consists of the continental coastal states of Kenya, Mozambique, South Africa and Tanzania and the island states of Madagascar, Mauritius, Seychelles and Comoros.

Integrated coastal zone management is a process of good governance that guides decision-making on the equitable allocation and sustainable use of natural resources. Integrated Planning and Management of Natural Resources describes systematic planning procedures for writing a hierarchy of strategic, zoning, management, and action plans. These plans can be adapted to any coastal management area in order to realize the social, economic, and environmental benefits that can be derived from spatially allocating, developing, and regulating the use of its diverse natural resources.

One of the outcomes of the international Ocean and Atmosphere Pacific International Conference held in Adelaide, South Australia on 23-27 October 1995 ... The first book to result from this NTF initiative, was published [in 1999] with the title "Modelling coastal sea processes". The present book ... is the second in this series.

This valuable book is a comprehensive volume on mangroves, with information accessible to both botany professionals and students. It provides an easy method of identifying mangroves and distinguishing one species from another. What is a mangrove and what are the criteria of mangroves are explained, along with descriptions of distinctions among major mangroves, mangrove associates, mangrove halophytes, and back mangals. Many photos and illustrations are provided, showing the visible features of mangroves. The volume also covers a range of other topics, including habitats and climatic conditions, morphological and reproductive features, how climate change is affecting mangroves and methods of mitigation and conservation. This book is about mangroves, the intertidal coastal forests that struggle every moment against hungry tides because mangroves flourish at the interface zone of land and sea. Like an evergreen forest in the tropical and subtropical

regions of the world, mangroves form definite coastal vegetation, providing protection to people living in such fragile zones against the occurrence of frequent natural calamities. Key features: Introduces important facts about mangroves: definition, early records of mangroves, categorization, and more Looks at the distribution of mangroves worldwide along with features of mangrove habitats and climatic conditions Describes the ecology and environmental conditions, particularly the concept of intertidal zones along estuary positions where tidal flows inundate mangroves Discusses the distinct morphological attributes and reproductive phenology of major mangroves Details the attributes of mangroves, covering a total of 78 species of intertidal flora, including 32 true mangroves, along with their diagnostic features, salient attributes, and illustrations for easy identification Highlights the burning environmental issue of climate change and its impact on mangroves Provides a variety of methods of restoration, conservation, and protection of mangroves

The mangrove, seagrass and coral reef ecosystems are of paramount ecological importance but have already undergone great degradation, which is advancing at an alarming rate. If present trends continue, the natural resource basis of the economy and ecology of tropical coastal regions will soon be ruined. This was the unanimous conclusion of the 110 scientists from 23 countries who gathered in Mombasa, Kenya, for a Symposium on the ecology of these ecosystems. Mangrove forest systems yield large amounts of fish, crabs, prawns and oysters. They are also valuable sources of fuelwood, timber, tannin and other natural products. Their non-marketable value is of equal importance: stabilization of the coastline, an indispensable nursery ground for numerous marine species with commercial value, a natural filter maintaining the clarity of nearshore water, a home for resident and migratory birds and other wildlife. Many of the true mangrove flora and fauna are now endangered by the clearing of the mangroves. It has been shown that in many countries between 25 and 100% of the mangrove forest has been destroyed already in the last twenty years. The international scientific assembly concluded that much can be done to stop the degradation of these damaged ecosystems and to rehabilitate them. But new techniques must be found to use them on a sustainable basis for long-term economic return and for the well-being of coastal human settlements and a healthy environment.

The iconic and beautiful Great Barrier Reef Marine Park is home to one of the most diverse ecosystems in the world. With contributions from international experts, this timely and fully updated second edition of *The Great Barrier Reef* describes the animals, plants and other organisms of the reef, as well as the biological, chemical and physical processes that influence them. It contains new chapters on shelf slopes and fisheries and addresses pressing issues such as climate change, ocean acidification, coral bleaching and disease, and invasive species. *The Great Barrier Reef* is a must-read for the interested reef tourist, student, researcher and environmental manager. While it has an Australian focus, it can equally be used as a reference text for most Indo-Pacific coral reefs.

Mangroves, commonly found along sheltered coastlines in the tropics and subtropics, fulfil important socio-economic and environmental functions: providing wood and non-wood forest products, protecting shores against wind, waves and water currents; conserving biological diversity; protecting coral reefs, sea-grass beds and shipping lanes against siltation; and providing habitat, spawning grounds and nutrients for a variety of fish and shellfish, including many commercial species. High population pressure in coastal areas has, however, led to the conversion of many mangrove areas to other uses. *The world's mangroves 1980-2005*, prepared in the framework of the Global Forest Resources Assessment 2005, provides comprehensive information on the current and past extent of mangroves in all countries and territories in which they exist. This information, as well as the gaps in information that come to light in the report, will assist mangrove managers and policy- and decision-makers worldwide in ensuring the conservation, management and sustainable use of the world's remaining mangrove ecosystems

Gulf Coast communities and natural resources suffered extensive direct and indirect damage as a result of the largest accidental oil spill in US history, referred to as the Deepwater Horizon (DWH) oil spill. Notably, natural resources affected by this major spill include wetlands, coastal beaches and barrier islands, coastal and marine wildlife, seagrass beds, oyster reefs, commercial fisheries, deep benthos, and coral reefs, among other habitats and species. Losses include an estimated 20% reduction in commercial fishery landings across the Gulf of Mexico and damage to as much as 1,100 linear miles of coastal salt marsh wetlands. This historic spill is being followed by a restoration effort unparalleled in complexity and magnitude in U.S. history. Legal settlements in the wake of DWH led to the establishment of a set of programs tasked with administering and supporting DWH-related restoration in the Gulf of Mexico. In order to ensure that restoration goals are met and money is well spent, restoration monitoring and evaluation should be an integral part of those programs. However, evaluations of past restoration efforts have shown that monitoring is often inadequate or even absent. Effective Monitoring to Evaluate Ecological Restoration in the Gulf of Mexico identifies best practices for monitoring and evaluating restoration activities to improve the performance of restoration programs and increase the effectiveness and longevity of restoration projects. This report provides general guidance for restoration monitoring, assessment, and synthesis that can be applied to most ecological restoration supported by these major programs given their similarities in restoration goals. It also offers specific guidance for a subset of habitats and taxa to be restored in the Gulf including oyster reefs, tidal wetlands, and seagrass habitats, as well as a variety of birds, sea turtles, and marine mammals.

The purpose of this book is to provide the latest, if not complete amount of updated information regarding the use of sediments for the estimation of chemical pollution in the aquatic environment from three main perspectives, namely, monitoring, ecological risk assessment and environmental management. The intended readers of this book include academicians, policy-makers, university students and researchers. This book contains eleven chapters. Chapters Three, Four, Six, Seven, Eight, Nine, Ten and Eleven mainly contain monitoring studies of pollutants (especially heavy metals) and sedimentary characteristics. Chapters Two, Five, Six, Eight, Nine and Ten have the portions largely consist of the monitoring data for the ecological risk assessments. Chapters One, Two, Four, Seven, Eight and Ten include recommendations for possible environmental management. Chapters One, Three, Four, Nine and Ten are reviews based on published data and findings, but with new insights and perspectives from researchers points of view. Chapter One reviews thirty publications, published between 2015 and August 2017, the management of coastal environments focusing on the pollutants investigated in the sedimentary components of the resourceful area in the coasts. Chapter Three reviews and compares scientific papers related to sedimentary characteristics of the tsunami sediments and deposits after the 2004 Indian Ocean and 2011 Tohoku-oki Tsunamis. Chapter Four reviews fourteen ISI published papers on the metal contamination in sediments of the Persian Gulf that were impacted by anthropogenic activities. Chapter Nine investigates geographical spatial distribution, and the ecological and children's health risk assessments of Copper (Cu) aquatic ecosystems ranging from rivers, mangroves, estuaries and offshore areas were investigated using cited Cu data in the sediments from 100 randomly selected published papers in the literature. Chapter Ten presents the geochemical speciation and risk assessment of heavy metals in southwestern Taiwan coastal sediments. The study was based on a review of more than eleven studies and the heavy metal data were re-analyzed for the enrichment factor and potential ecological risk index. Other chapters (namely Chapters

Two, Five, Six, Seven, Eight and Eleven) investigated metal pollution by using sediment watch, reporting metal data for the first time. Chapter Two presents the geochemical fractions of six heavy metals on surface sediments collected from drainages of Malacca's industrial area and the Malacca River. Chapter Five presents the ecological risk assessment of heavy metals in the sediments collected, in 2007, from the Sepang Besar River and the Sepang Kecil River, that were previously a pig farming area in the early 1990s. Chapter Six investigates the distribution and enrichment of heavy metals in the surface marine sediments of coastal Sabah, Malaysia. Chapter Seven reports the concentrations of Cr, Co, Mn and Sc in the mangrove snail in association with the above four metals with their habitat surface sediments. Chapter Eight presents the ecological risk assessments of heavy metals in surface sediments collected from a rocky shore in Tanjung Harapan. Chapter Eleven reports the Nd isotopic signature in sedimentary Mn/Fe oxides, which can be used as a tracer of the variations of west Pacific oceanographic exchange during the last 27Ka. Prominent scientists from Japan such as Prof. Hideo Okamura (Kobe University, Japan), Prof. Hiroya Harino (Kobe College, Japan), Prof. Minoru Saito (Nihon University, Japan) and Prof. Kazuhiro Toyoda (Hokkaido University, Japan), Dr. Gen Kanaya and Dr. Tomohiko Isobe (both from National Institute of Environmental Sciences, Tsukuba, Japan), who co-authored some of the chapters have helped to improve the quality of the chapters in this book. Chapters from Prof. Chen-Feng You from the National Cheng Kung University (Taiwan), and Dr. Moslem Sharifinia from the Iranian National Institute for Oceanography and Atmospheric Science (Iran) are also important elements concerning the construction of international readership for this book.

Due to its vulnerability to a wide variety of climate change impacts, Bangladesh has become a laboratory for adaptation and resilience strategies in the developing world. The knowledge shared by experienced practitioners who have a deep understanding of the complex context of this country is an invaluable resource. The International Centre for Climate Change and Development has brought together a host of experts across multiple disciplines to provide a detailed look at Bangladesh's ongoing struggle to prepare for the inevitable threats that climate change poses. This volume presents public policy-oriented strategies across numerous sectors, including agriculture, freshwater management, forests, finance, human rights, health systems, flood control, infrastructure, solar energy, and more. Successes and shortcomings both provide useful lessons for other countries grappling with similar climate threats. This book offers the latest research findings for a wider audience. - Showcasing the wealth of experience with adaptation and resilience in Bangladesh- Drawing from expert practitioners across the numerous sectors affected by climate change- Highlighting key lessons for other Least Developed Countries.

Published with ISME, ITTO and project partners FAO, UNESCO-MAB, UNEP-WCMC and UNU-INWEH This atlas provides the first truly global assessment of the state of the world's mangroves. Written by a leading expert on mangroves with support from the top international researchers and conservation organizations, this full colour atlas contains 60 full-page maps, hundreds of photographs and illustrations and a comprehensive country-by-country assessment of mangroves. Mangroves are considered both ecologically and from a human perspective. Initial chapters provide a global view, with information on distribution, biogeography, productivity and wider ecology, as well as on human uses, economic values, threats, and approaches for mangrove management.

These themes are revisited throughout the regional chapters, where the maps provide a spatial context or starting point for further exploration. The book also presents a wealth of statistics on biodiversity, habitat area, loss and economic value which provide a unique record of mangroves against which future threats and changes can be evaluated. Case-studies, written by regional experts provide insights into regional mangrove issues, including primary and potential productivity, biodiversity, and information on present and traditional uses and values and sustainable management.

The first comprehensive tool-kit for coastal planners and those aiming to achieve effective coastal management worldwide. Coastal Planning and Management provides a link between planning and management tools and thus includes all stages in the process, from development through evaluation to implementation. Drawing on examples of successful coastal planning and management from around the world, the authors provide clear and practical guidelines for the people who make daily decisions about the world's coastlines. Coastal Planning and Management is an invaluable resource for professionals in environmental and planning consultancies, international organizations and governmental departments, as well as for academics and researchers in the local and international fields of geography, marine and environmental science, marine and coastal engineering and marine policy and planning.

Lakes, wetlands and coastal regions provide essential services critical to the survival of human, wildlife and, by and large, the ecosystems, which are constantly threatened by anthropogenic activities, environmental degradation and climate change. Marine resources, particularly mangroves and corals, are vulnerable to coastal developments, including coastal reclamation, and human settlements that discharge large quantities of wastes into the seas. Climate change impacts, such as increased salt intrusion and sea level rise, may additionally induce regime shifts detrimental to these delicate ecosystems. And the warmer climate has increased the frequency, duration and intensity of catastrophic coastal disturbances, implicating profound uncertainty to the sustainability of coastal infrastructures and resources essential for human populations. This book is written for students, researchers and practitioners pursuing teaching and research related to sustainable development, and the United Nations' Sustainable Development Goals (UNSDGs). It provides a unique approach on sustainable development, viewed from the perspectives of providing solutions via model simulation, to solve sustainable development issues related to human population growth, and impacts due to climate change. It provides the scientific knowledge and technical skills necessary to achieve valuable insights for mitigating the predicted adverse impacts and for developing sustainable development strategies, incorporating climate and environmental adaptations.

ALEXANDER GILLESPIE & WILLIAM C.G. BURNS The idea for this book grew out of the Ecopolitics conference in Canberra, Australia in 1996. The conference captured the ferment of the climate change debate in the South Pacific, as well as some its potential implications for the region's inhabitants and e- systems. At that conference, one of the editors (Gillespie) delivered a paper on climate change issues in the region, as did Ros Taplin and Mark Diesendorf, who are also c- tributors to this volume. This book focuses on climate change issues in Australia, New Zealand, and the small island nations in the Pacific as the world

struggles to cope with possible the impacts of environmental change and to formulate effective responses. While Australia and New Zealand's per capita emissions of greenhouse gases are among the highest in the world, their aggregate contributions are small. However, both nations may exert a disproportionate influence in the global greenhouse debate because their obstinate positions at recent conferences of the parties to the United Nations Framework Convention on Climate Change (UNFCCC) may provide justification for other developed nations, as well as developing countries, to refuse to make meaningful reductions in their greenhouse gas emissions.

This book outlines the performance and management of mangroves in the changing climatic scenario of the Asia-Pacific region and draws examples and lessons from the national and community-driven mangrove conservation programs of relevant countries including Pakistan, India, Bangladesh, Sri Lanka, Myanmar, Thailand, Cambodia, Indonesia, the Philippines, and Japan as well as the Pacific islands. By highlighting the major drawbacks that hinder effective mangrove conservation, the book contributes towards enhancing climate resilience of communities through proposition of corrective methods and ameliorative approaches of mangrove conservation. Mangroves play an important role in adapting to climate change and provide a plethora of ecosystem services that are fundamental to human survival. Yet these ecosystems are exceptionally prone to extinction due to increased human interventions and changes in environmental boundary conditions. Especially in the Asia-Pacific region, mangroves have dwindled at an exceptional high rate over the past three decades. As the threat of climate change hovers over millions of people in this region, particularly those who crowd the low-lying coastal areas, conservation/restoration of mangroves through appropriate policies and practices remain highly imperative. The primary target readers for this book are students and researchers in the fields of conservation and management of mangroves, especially from the developing tropical countries of the Asia-Pacific region. Other target groups comprise policy planners, practitioners, and NGO workers, who will be able to apply the collective knowledge from this work towards proactive mangrove conservation through effective mediation in local communities.

*Dynamic Sedimentary Environments of Mangrove Coasts* provides knowledge on the importance of sedimentary dynamics in managing mangrove forests. In the first part of the book, the editors seamlessly offer a general introduction of mangrove sedimentary dynamics. This leads into more in-depth information on soil surface elevation change, sea level rise, and the importance of sedimentary dynamics in the loss or gain of blue carbon. The book concludes the discussion of mangrove sedimentary dynamics by addressing the issues of climate change (e.g. sea level rise and blue carbon) on mangrove restoration and sediment. This book will assist coastal managers and academics in addressing the gaps in mangrove restoration and coastal management. As such, it will be a valuable reference for advanced undergraduate students, graduate students, researchers, academics in the field of coastal restoration, and coastal management practitioners. Provides a state-of-the-art summary of research into sedimentary dynamics in mangrove forests Includes updates on issues of climate change-relevant to mangroves, such as blue carbon and sea level rise Presents scientific

background and successful case studies for mangrove restoration that can solve problems relating to mangrove management

In Vietnam, mangrove forests have been threatened by economic pressures and climate change. This report aims to analyze both opportunities and constraints for mangrove protection and management in Vietnam. The study found that local people appreciate the role that mangroves play in providing income, an attractive landscape and shelter from climate change related floods and storms. Many communities would be willing to contribute between USD 2-20 per year to a trust fund so as to protect their forests. A large number of policies and projects promote mangrove conservation activities. This has helped strengthen law enforcement, raised local awareness of the role and importance of maintaining forests, and restricted the conversion of mangroves to other economic activities. Government policies and development projects also provide capacity building, training and seedlings for mangrove reforestation activities at the studied sites. Additionally, new incentives such as payment for forest environmental services (PFES) are emerging as a potential source of finance to support mangrove protection and development in the future. Collective action for mangrove protection is widely recognized and promoted among study sites. People have self-organized strikes and protests to oppose converting mangroves to other economic purposes. Many policies and projects offer social and economic incentives for mangrove protection. However, they are impeded by insecure tenure, land grabbing, elite capture, inequitable benefit-sharing, and unclear responsibilities among government agencies at central, provincial and multilateral levels. Access to information on both policies and projects is difficult for local people. The monitoring and evaluation systems, incentives and disincentives designed by policies and projects have low enforcement and compliance. Policies and projects strongly emphasize and create incentives to replant mangrove forests, rather than to maintain and conserve existing mangrove forest areas. Incentives are also designed to compensate local labor costs for replanting mangrove or patrolling activities, rather than addressing the direct drivers of deforestation and degradation. Protecting mangroves requires a policy shift in land-use planning to address the drivers of mangrove deforestation and degradation. These drivers, in turn, respond to national and provincial economic development agendas, which focus on aquaculture expansion and migration. Cross-sectoral coordination also needs to be further enhanced to improve effectiveness in law enforcement. Enhancing local participation in mangrove forest protection and development requires a gender-sensitive approach and enabling conditions, such as well-enforced policies, accountable and transparent benefit-sharing, and inclusive decision making.

"This global synthesis report serves as a call to action to decision makers. It provides a science-based synthesis of the different types of goods and services provided by mangroves and the associated risks in losing these services in the face

