

Forest Conservation and Management



Russell Santiago

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Deforestation has led to many serious problems on Earth like global warming, pollution, soil erosion, etc. Thus, the conservation and sustainable use of forest and its resources is the need of this hour. Forest conservation refers to the practice of using forest resources in the optimum way so that we fulfill our requirements without jeopardizing that of the future generations. This book aims to provide essential information about this field. It presents the complex subject of forest conservation in the most comprehensible and easy to understand language. The topics covered in this extensive text deal with the core subjects of this field. It will be of great help to graduates and post-graduates in the fields of landscape planning, sustainable forest management and governance.

Russell Santiago pursued his Master of Forest Conservation from University of Toronto, Canada. His areas of interest are silviculture, forest genetic resources and reforestation. He is a renowned lecturer of undergraduate programs and travels extensively for educating students across the globe. Santiago is on the editorial board of several renowned environmental journals; and has edited over 50 technical papers and eight reference books.

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Edited by
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Preface

Deforestation has led to many serious problems on Earth like global warming, pollution, soil erosion, etc. Thus, the conservation and sustainable use of forest and its resources is the need of this hour. Forest conservation refers to the practice of using forest resources in the optimum way so that we fulfill our requirements without jeopardizing that of the future generations. This book aims to provide essential information about this field. It presents the complex subject of forest conservation in the most comprehensible and easy to understand language. The topics covered in this extensive text deal with the core subjects of this field. It will be of great help to graduates and post-graduates in the fields of landscape planning, sustainable forest management and governance.

To facilitate a deeper understanding of the contents of this book a short introduction of every chapter is written below:

Chapter 1- Forest conservation is the management of forests. Sustainable forest management is concerned with the ecological, economic and socio- cultural aspects related to forests. This chapter is an introductory chapter which will introduce briefly all the significant aspects of forest conservation.

Chapter 2- Forest management manages the administration, economic and social aspect of forests. Some of the techniques involved in the process of forest management are timber extraction, cutting roads and preventing fire. Other aspects elucidated in this text are ecoforestry, community forestry, close to nature forestry and high conservation value forest.

Chapter 3- Techniques and approaches are an important component of any field of study. The techniques mentioned in this chapter are afforestation, silviculture, reforestation, selection cutting and forest protection. Afforestation is the process of growing a forest in any area where there was no tree cover earlier. The following chapter elucidates the various techniques and approaches of forest conservation.

Chapter 4- This chapter is a compilation of the various types of forests. Some of the forests that have been explained in the following section are taiga, temperate forests and tropical rainforest. The difference between temperate forests and rainforests is the difference between their climates and the animals that adapt in these forests. The section helps the readers in understanding all the types of forests and the differences between them.

Chapter 5- Deforestation is one of the biggest threats to forests; deforestation is the clearance of forests. The purpose behind this clearance can be industrial or it can be done with the intention of converting these forests into farms. Alternatively, the threats of forests are forest dieback, illegal logging, clearcutting and wildfire. The aspects explained in this chapter are of vital importance, and provide a better understanding of forests.

Chapter 6- Restoration ecology, conservation movement and conservation biology are the vital aspects of forest conservation. Restoration ecology is the practice of restoring destroyed ecosystems whereas the conservation movement is a social movement that pursues to safeguard the environment. This section elucidates the aspects and developments of forest conservation.

I would like to share the credit of this book with my editorial team who worked tirelessly on this book. I owe the completion of this book to the never-ending support of my family, who supported me throughout the project.

Editor

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Introduction to Forest Conservation

Forest conservation is the management of forests. Sustainable forest management is concerned with the ecological, economic and socio-cultural aspects related to forests. This chapter is an introductory chapter which will introduce briefly all the significant aspects of forest conservation.

Sustainable forest management (SFM) is the management of forests according to the principles of sustainable development. Sustainable forest management has to keep the balance between three main pillars: ecological, economic and socio-cultural. Successfully achieving sustainable forest management will provide integrated benefits to all, ranging from safeguarding local livelihoods to protecting the biodiversity and ecosystems provided by forests, reducing rural poverty and mitigating some of the effects of climate change.

The “Forest Principles” adopted at The United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 captured the general international understanding of sustainable forest management at that time. A number of sets of criteria and indicators have since been developed to evaluate the achievement of SFM at the global, regional, country and management unit level. These were all attempts to codify and provide for independent assessment of the degree to which the broader objectives of sustainable forest management are being achieved in practice. In 2007, the United Nations General Assembly adopted the Non-Legally Binding Instrument on All Types of Forests. The instrument was the first of its kind, and reflected the strong international commitment to promote implementation of sustainable forest management through a new approach that brings all stakeholders together.

Definition

A definition of SFM was developed by the Ministerial Conference on the Protection of Forests in Europe (FOREST EUROPE), and has since been adopted by the Food and Agriculture Organization (FAO). It defines sustainable forest management as:

The stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems.

In simpler terms, the concept can be described as the attainment of balance – balance between society’s increasing demands for forest products and benefits, and the pres-

ervation of forest health and diversity. This balance is critical to the survival of forests, and to the prosperity of forest-dependent communities.

For forest managers, sustainably managing a particular forest tract means determining, in a tangible way, how to use it today to ensure similar benefits, health and productivity in the future. Forest managers must assess and integrate a wide array of sometimes conflicting factors – commercial and non-commercial values, environmental considerations, community needs, even global impact – to produce sound forest plans. In most cases, forest managers develop their forest plans in consultation with citizens, businesses, organizations and other interested parties in and around the forest tract being managed. The tools and visualization have been recently evolving for better management practices.

In 2014, at the request of Member States, the Food and Agriculture Organization of the United Nations developed and launched the Sustainable Forest Management Toolbox, an online collection of tools, case studies and other resources to support countries implementing sustainable forest management.

Because forests and societies are in constant flux, the desired outcome of sustainable forest management is not a fixed one. What constitutes a sustainably managed forest will change over time as values held by the public change.

Criteria and Indicators



Deforestation of native rain forest in Rio de Janeiro City for extraction of clay for civil engineering (2009 picture). An example of non sustainable forest management.

Criteria and indicators are tools which can be used to conceptualise, evaluate and implement sustainable forest management. Criteria define and characterize the essential elements, as well as a set of conditions or processes, by which sustainable forest management may be assessed. Periodically measured indicators reveal the direction of change with respect to each criterion.

Criteria and indicators of sustainable forest management are widely used and many countries produce national reports that assess their progress toward sustainable forest management. There are nine international and regional criteria and indicators initia-

tives, which collectively involve more than 150 countries. Three of the more advanced initiatives are those of the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (also called the Montreal Process), Forest Europe, and the International Tropical Timber Organization. Countries who are members of the same initiative usually agree to produce reports at the same time and using the same indicators. Within countries, at the management unit level, efforts have also been directed at developing local level criteria and indicators of sustainable forest management. The Center for International Forestry Research, the International Model Forest Network and researchers at the University of British Columbia have developed a number of tools and techniques to help forest-dependent communities develop their own local level criteria and indicators. Criteria and Indicators also form the basis of third-party forest certification programs such as the Canadian Standards Association's Sustainable Forest Management Standards and the Sustainable Forestry Initiative Standard.

There appears to be growing international consensus on the key elements of sustainable forest management. Seven common thematic areas of sustainable forest management have emerged based on the criteria of the nine ongoing regional and international criteria and indicators initiatives. The seven thematic areas are:

- Extent of forest resources
- Biological diversity
- Forest health and vitality
- Productive functions and forest resources
- Protective functions of forest resources
- Socio-economic functions
- Legal, policy and institutional framework.

This consensus on common thematic areas (or criteria) effectively provides a common, implicit definition of sustainable forest management. The seven thematic areas were acknowledged by the international forest community at the fourth session of the United Nations Forum on Forests and the 16th session of the Committee on Forestry. These thematic areas have since been enshrined in the Non-Legally Binding Instrument on All Types of Forests as a reference framework for sustainable forest management to help achieve the purpose of the instrument.

On January 5, 2012, the Montreal Process, Forest Europe, the International Tropical Timber Organization, and the Food and Agriculture Organization of the United Nations, acknowledging the seven thematic areas, endorsed a joint statement of collaboration to improve global forest related data collection and reporting and avoiding the proliferation of monitoring requirements and associated reporting burdens.

Ecosystem Approach

The Ecosystem Approach has been prominent on the agenda of the Convention on Biological Diversity (CBD) since 1995. The CBD definition of the Ecosystem Approach and a set of principles for its application were developed at an expert meeting in Malawi in 1995, known as the Malawi Principles. The definition, 12 principles and 5 points of “operational guidance” were adopted by the fifth Conference of Parties (COP5) in 2000. The CBD definition is as follows

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Application of the ecosystem approach will help to reach a balance of the three objectives of the Convention. An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompasses the essential structures, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems.

Sustainable forest management was recognized by parties to the Convention on Biological Diversity in 2004 (Decision VII/11 of COP7) to be a concrete means of applying the Ecosystem Approach to forest ecosystems. The two concepts, sustainable forest management and the ecosystem approach, aim at promoting conservation and management practices which are environmentally, socially and economically sustainable, and which generate and maintain benefits for both present and future generations. In Europe, the MCPFE and the Council for the Pan-European Biological and Landscape Diversity Strategy (PEBLDS) jointly recognized sustainable forest management to be consistent with the Ecosystem Approach in 2006.

Independent Certification

Growing environmental awareness and consumer demand for more socially responsible businesses helped third-party forest certification emerge in the 1990s as a credible tool for communicating the environmental and social performance of forest operations.

There are many potential users of certification, including: forest managers, scientists, policy makers, investors, environmental advocates, business consumers of wood and paper, and individuals.

With third-party forest certification, an independent organization develops standards of good forest management, and independent auditors issue certificates to forest operations that comply with those standards. Forest certification verifies that forests are well-managed—as defined by a particular standard—and chain-of-custody certification tracks wood and paper products from the certified forest through processing to the point of sale.

This rise of certification led to the emergence of several different systems throughout the world. As a result, there is no single accepted forest management standard worldwide, and each system takes a somewhat different approach in defining standards for sustainable forest management.

In its 2009–2010 Forest Products Annual Market Review United Nations Economic Commission for Europe/Food and Agriculture Organization stated: “Over the years, many of the issues that previously divided the (certification) systems have become much less distinct. The largest certification systems now generally have the same structural programmatic requirements.”

Third-party forest certification is an important tool for those seeking to ensure that the paper and wood products they purchase and use come from forests that are well-managed and legally harvested. Incorporating third-party certification into forest product procurement practices can be a centerpiece for comprehensive wood and paper policies that include factors such as the protection of sensitive forest values, thoughtful material selection and efficient use of products.



The ecolabel of the Forest Stewardship Council for certified sustainable forest product.

There are more than fifty certification standards worldwide, addressing the diversity of forest types and tenures. Globally, the two largest umbrella certification programs are:

- Programme for the Endorsement of Forest Certification (PEFC)
- Forest Stewardship Council (FSC)

The area of forest certified worldwide is growing slowly. PEFC is the world’s largest forest certification system, with more than two-thirds of the total global certified area certified to its Sustainability Benchmarks.

In North America, there are three certification standards endorsed by PEFC – the Sustainable Forestry Initiative, the Canadian Standards Association’s Sustainable Forest Management Standard, and the American Tree Farm System. FSC has five standards in North America – one in the United States and four in Canada.

While certification is intended as a tool to enhance forest management practices throughout the world, to date most certified forestry operations are located in Europe and North America. A significant barrier for many forest managers in developing countries is that they lack the capacity to undergo a certification audit and maintain operations to a certification standard.

Forest Governance



Countries participating in the UNREDD program and/or Forest Carbon Partnership Facility.

- UN-REDD participants
- Forest Carbon Partnership Facility participants
- participants in both

Although a majority of forests continue to be owned formally by government, the effectiveness of forest governance is increasingly independent of formal ownership. Since neo-liberal ideology in the 1980s and the emanation of the climate change challenges, evidence that the state is failing to effectively manage environmental resources has emerged. Under neo-liberal regimes in the developing countries, the role of the state has diminished and the market forces have increasingly taken over the dominant socio-economic role. Though the critiques of neo-liberal policies have maintained that market forces are not only inappropriate for sustaining the environment, but are in fact a major cause of environmental destruction. Hardin's tragedy of the common (1968) has shown that the people cannot be left to do as they wish with land or environmental resources. Thus, decentralization of management offers an alternative solution to forest governance.

The shifting of natural resource management responsibilities from central to state and local governments, where this is occurring, is usually a part of broader decentralization process. According to Rondinelli and Cheema (1983), there are four distinct decentralization options: these are: (i) Privatization – the transfer of authority from the central government to non-governmental sectors otherwise known as market-based service provision, (ii) Delegation – centrally nominated local authority, (iii) Devolution – transfer of power to locally acceptable authority and (iv) Deconcentration – the redistribution of authority from the central government to field delegations of the cen-