

SUSTAINABLE FORESTS

Edited by
Jeffrey Sayer, Neil Byron and
Gillian Petrokofsky

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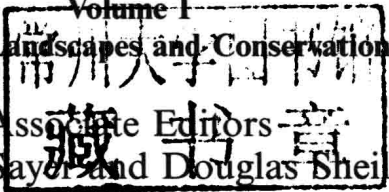
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Associate Editors
Jeffrey Sayer and Douglas Shei



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These volumes are dedicated to our friend and former colleague Paul Jarvis (d. February 2013), editor of Volume 2, in recognition of his invaluable contribution to our understanding of forest science.

SUSTAINABLE FORESTS

Edited by Jeffrey Sayer, Neil Byron and Gillian Petrokofsky

This four-volume set is edited by leading experts on the evolving role of forests in providing raw materials and environmental services to meet society's changing needs. It brings together in one collection a series of papers that have helped to shape thinking on forests as a key sustainable resource. The collection includes some classic papers but is mainly composed of more recent publications at the cutting edge of thinking on forests and their sustainable use. The set includes a general introduction and each volume is introduced by a new overview essay, placing the selected papers in context. The breadth of subject matter is considerable, ranging from the management and conservation of forest landscapes, soils, hydrology and tree-atmosphere relations, socio-economic aspects including the livelihoods of indigenous people, policy and economics, to contemporary issues such as ecosystem services and climate change.

Editors

Jeffrey Sayer is Professor of Conservation and Development at James Cook University, Queensland, Australia, and a member of the Independent Science and Partnership Council of the Consultative Group for International Agricultural Research. He was founding Director General of the Center for International Forestry Research (CIFOR) in Indonesia.

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PREFACE

Forestry used to be a pretty straightforward, technical discipline; it was preoccupied with stability and maintaining the status quo. It concerned itself with management interventions today to ensure the supply of a limited number of goods and services, often in the relatively distant future. The profession of forester was a secure, respectable middle-class occupation that often came with a smart uniform. Now that has changed radically. In the past few decades forests have become the concern of everyone. The media are full of forest stories, mostly portraying catastrophic losses of forests and their resources. Forest issues are debated at global political summits and amongst the people of small communities. The understanding and practice of sustainable forestry is being constantly reinvented. These four volumes bring together papers published in the recent past that illustrate and reflect this evolving concern about the world's forests.

Throughout the world, the quest for “Sustainable Forests” now pre-occupies governments, communities, environmental and social non-governmental organisations, researchers and land managers (including forestry practitioners and protected area managers). Our concern in editing these volumes is to help make the basic empirical knowledge of forest processes more readily available to the increasing range of people who aspire to influence the “forest agenda”.

Concern about the health, condition and extent of forests has been around for centuries, as have concerns about the well-being and prospects for the people who live in/near forests and depend on them. Many people believe that concern for forests was a major driver of the way nation-states came to organise themselves – the imperative of managing the common property resources at various spatial scales upon which all societies depend.

But, especially since the 1980s when the United Nations Development Programme and Food and Agriculture Organization initiated the Tropical Forest Action Plan, public and professional concerns about massive tropical deforestation, the continuing degradation of forests in many regions and the multiple demands that societies now place upon forests and trees has grown exponentially.

“Our Common Future” – the 1989 report of the World Commission on Environment and Development – raised the banner of “*Sustainable Development*”. It brought much greater attention to the quest to re-balance environmental protection and economic growth around the world. Many people who were interested in forests, forested landscapes and forest-dependent people almost immediately began to wonder how the same sustainable development principles and goals might apply in the context of forests. The WCED was soon followed by a World Commission on Forests and Sustainable Development which reported in 1995. A number of pictures began to emerge in various countries, of what sustainable (or at least “significantly more sustainable”) forests might look like, and what sort of forest – and landscape-management practices – might achieve such goals. The Rio Earth summit in 1992 invested a lot of energy into attempts to formulate legally binding agreements on forests – but its inability to negotiate a strong and meaningful agreement merely served to underline how different societies valued forests and the land upon which they grew in quite different ways.

A number of forest events came to occupy political and public opinion. Acid rain in Europe, forest fires in the Mediterranean and logging of hitherto pristine forests in the tropics became icons of the environmental movement. The plight of forest dwelling indigenous people aroused sympathy around the world. The “Spotted Owl” debate in the USA Pacific Northwest led to a new philosophy of Forest Ecosystem Management which would stress the underlying ecosystem principles for managing forests at large spatial scales for multiple industrial, recreational and aesthetic purposes. The Forest Stewardship Council (FSC) was born as an NGO initiative to encourage more sustainable forests by using consumer pressure on the supply chain, through the importers and retailers of timber in western countries. The Montreal Process led to a set of “Principles, Criteria and Indicators for Sustainable Forest Management (SFM)” that have been developed in the hope/expectation of global application. Similar principles and criteria have now emerged in various parts of the world.

So there were – and still are – many different perceptions of sustainable forests, and each of them is internally complex, multi-dimensional and challenging and in their context valid. Some are still a work in progress, they have internal contradictions and inconsistencies, or require a skill set that very few agencies (let alone individuals) could possess and apply.

While the public and governments have very high expectations and ambitions for the future of their forests, many researchers and practitioners at the forest edge find these challenges to be profoundly daunting. Many are left wondering what to do and how to meet this great ambitious aspiration, especially when the *specific* challenges of caring for forests long-term – on an ecologically, socially and economically sustainable basis – vary so much through space and time.

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Forestry and environmental management specialists in many countries feel overwhelmed – sometimes confused and sometimes inadequately equipped to answer society's challenge. In many cases they also feel disempowered as the decision making about forests is shifting to a diversity of civil society and governmental agencies that have no formal training in conventional forestry. Just as the public is more concerned than ever about forests so students are less interested in studying forestry and opt instead for "Environmental Sciences". This volume is aimed to a large extent at this audience of non-foresters and aims to demonstrate to them that forest science has still a lot to offer in achieving sustainable forests.

The publishers agreed to produce this set of articles as a contribution to this rich debate on forests and their sustainability. The aim is to help equip concerned people with the knowledge needed to meet these great challenges. The set is aimed at the many well-intentioned and highly motivated people working on and in forests globally.

Many libraries have limited journal stocks and cannot afford back issues or the comprehensive electronic digitized resources sometimes offered by publishers. This is particularly true of smaller universities and colleges in the developed world and of even the larger universities in developing economies such as Eastern Europe, Africa and Asia, where they are only comparatively recently developing their academic libraries.

We hope that the introductory overview chapters in each volume will be particularly valuable in providing a review of key literature for lecturers and students, who are otherwise faced with thousands of papers to sift through in their subjects. In many cases both lecturers and students, and even researchers, are often unaware of the value of certain classic older papers or reports from the grey literature, or literature from other hemispheres. We have therefore brought together and put into context a coherent set of inter-related papers on priority emerging issues. The aim is to present those papers which either strongly influenced the development of new approaches to forests or which deserve greater recognition for the insights that they contain. There are countless ways of attempting to organise all this material – e.g. what do people do to forests and why, what are the consequences and how are those consequences dealt with by society? We have chosen to group the papers around what we perceive as the major current themes of the sustainable forest discourse.

As editors, we have sought out not only the most influential, but also some very important but perhaps under-recognised papers with real merit, and grouped them by topics that not only reflect current "hot issues" but perhaps some "sleepers" that we believe will become increasingly important. This is a little like judging a beauty contest, and any expert panel would probably disagree on the top 20 journal articles in any particular field. We have also tried to compile a suite of high-quality readings that would be particularly

useful to developing country institutions which lack access to major journals (or more boutique journals, grey literature, NGO reports, etc.). We have tried to find a major conceptual or synthesis paper and 2–3 more detailed local examples for each of those issues.

Although all the articles in these four volumes are written in English, the editors have attempted to ensure that African, Latin American, Chinese and European authors are represented, not just USA/UK authors, and a wide coverage of the “case-study” papers. For example, the Brazilian forest economist Alfredo Homma is well known and highly respected amongst scholars writing in Portuguese and Spanish, but the paper included in Volume III is one of the very few examples of his world-class work available in English.

This 4-volume set may be seen as a surrogate textbook, particularly for those interdisciplinary courses (e.g. including geography, biodiversity conservation, environmental change, sustainable development, not just in forestry) which are focusing on emerging issues. Although each volume has its own strong theme, the editors have tried to ensure that all four volumes were connected (such as through cross-referencing between volumes); this emphasises the synthesis of different kinds of scientific knowledge – each of the four volumes is not an isolated silo.

The editors are confident that this wide-ranging collection of carefully-selected articles will help deepen understanding and stimulate debate about the crucial role of forests in sustainable development. The science that underpins sustainable forestry has expanded its horizons in the past few decades – forestry is no longer a technical skill centred on a narrow discipline – the people managing forests are drawing upon the skills and competencies of a wide range of scientists and practitioners. Civil society is asserting its right to be the ultimate judge of what sort of forests we need, how much of them we want and where they should be. Societies’ expectations of forests will certainly change in the future as more people move to cities and climate change creates new threats and opportunities for forests. Forest science will and should continue to evolve and adapt – and a study of the papers in these four volumes will provide an excellent grounding for anyone who wants to engage with these processes in the future.

Overview of the scope of the four volumes

Volume I

Forests, landscapes and conservation

This is a theme which has recently risen in prominence since the sixth Forest Day in Doha, Qatar, on 2 December 2012. Volume I, edited by Jeffrey Sayer and Douglas Sheil, covers this very broad topic, in seven parts. The first two

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parts, “Overview and contexts” and “History and modern classics”, highlight historical and recurring conservation themes and discuss the conceptual development of forest conservation planning. The third part, “Beyond the pristine” considers the value of tree cover outside “natural” forest settings, an important consideration for a landscape approach to conservation. The fourth part “Concerning methods” examines some of the important methods used to research these themes, from field surveys of biodiversity to multi-scale monitoring of landscapes. The questions of how forest landscapes should be managed and by whom, are posed in Part 5, “Governance and oversight”. The sixth and seventh parts, “Taking stock” and “The road ahead” review what we already know, what we need to know and what approaches might be needed to make forest conservation more effective in the future.

Volume II

Forests and the physical, chemical and biological environment

This volume, edited by the late Paul Jarvis, discusses environmental processes across the soil-tree-forest-troposphere-climate continuum in five parts. The first, “Forest and tree properties”, focuses particularly on the mass and area of foliage carried by trees. The second part, “Radiation, energy and production”, looks at interception of solar radiation and canopy structure, solar radiation reflectance and energy exchanges. The third part reviews a broad range of factors that affect “Transpiration and evaporation” in forests, and discusses in some details the Soil-Plant-Atmosphere-Continuum (SPAC). Part 4, “Forest carbon, tropospheric CO₂ and forest management” examines the processes involved in the removal of carbon dioxide from the atmosphere and the current interest in “carbon forestry”, which is concerned with the conservation and enhancement of the stocks of carbon in forests through modification of practical forest management. Part 5, “Likely impacts of climate change”, discusses the role of carbon dioxide, temperature, nitrogen stimulated carbon sequestration in forest and agricultural land and the role of nitrous dioxide in likely forest responses to climate change.

Volume III

Forests, people and livelihoods

This volume, edited by Neil Byron, takes a historical approach to the literature, identifying three distinct periods: an emergence/discovery phase, a consolidation/experimentation phase and a mainstreaming phase in each of seven main parts. The first part, “Access and tenure seeks to understand who has driven the changes in forest use and condition, and why and how changes have been brought about. Part 2, “Importance of traditional and indigenous

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uses” asks a related set of questions about what forest goods and services are valued by traditional forest users. Part 3, “Emerging markets for Non Timber Forest Products”, discusses how people could be lifted out of poverty by the commercialisation and enhanced marketing of NTFPs on domestic and international markets. Part 4, “Participation and gender”, and Part 5, “Challenges in implementing community forestry”, track the development of participatory forestry and gender-balanced processes in decision making and reflect on the widely differing experiences of community-based forest management. Part 6, “Agroforestry, small-holder farm forestry and urban forestry”, traces evolution of attitudes and practices dealing with trees outside forests. The final part, “Lessons for the West?” focuses particularly on the debates about payment for ecosystem services, and on institutions for participatory, collaborative resource management.

Volume IV

Forest policy, economics and governance

This volume edited by Margaret Shannon, Bas Arts, Victor Teplyakov and Gillian Petrokofsky, provides a broad discussion of the governance, policy, law and economics of “sustainable forests”, drawing on theory and practice in three main sections. Part 1, “Emerging regime of global forest governance”, traces the emergence of new institutions, new policies, new legal regimes and new problem definitions for international forestry. Part 2, “Role of science and economics in forest policy and governance”, illustrates how global forest governance is a complex and evolving practice aimed at the lodestar of sustainability and includes papers that examine how science is not separate from the practice or policy of sustainable forestry, but is fully integrated with the entire process. Part 3, “Markets as models for policy and new modes of governance”, examines certification of sustainable forest management and, using a different lens from that used in Volume III, the development of markets for ecological services, particularly through payments for environmental services.

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