

## Book Review

**CARBON SINKS AND CLIMATE CHANGE: FORESTS IN THE FIGHT AGAINST GLOBAL WARMING**, C.A. Hunt, Edward Elgar, 2009, 236 pages, ISBN 978-1-84720-977-1

Forests play a very significant role in the global carbon cycle, having absorbed approximately one third of recent anthropogenic emissions of carbon dioxide (CO<sub>2</sub>) from the atmosphere (Streck et al. 2008). However, human activities in forests have also become an important source of carbon emissions, with deforestation contributing to about one fifth of the annual anthropogenic total. Humans contribute to CO<sub>2</sub> emissions in two ways – through burning fossil-fuels and converting forestlands to other uses. Initially, land-use changes (deforestation) were the principle source of carbon emissions. However, starting in the 20th century, fossil-fuel emissions have increased rapidly, while emissions due to deforestation have gradually declined. Therefore, one way to address the issue of increasing carbon emissions and climate change is to maintain and increase the stock of sustainably managed forests.

Thus the attention placed on forests as carbon sinks has increased the need for detailed knowledge of the role forests play in this regard, as well as accurate information about the state of the world's forests. In this context the publication of this book is very timely and Dr Hunt has done an outstanding job of highlighting issues relating to carbon sinks and climate change by showing the important roles that forests can play in the future.

This excellent book provides theoretical and empirical evidence on issues related to carbon sinks and climate change which provide pointers to key elements of a successful strategy for global CO<sub>2</sub> emissions reduction. The task of analysing these issues is well covered in the book's eight chapters. In its introduction a useful background to the issues and policy framework is provided by covering the historical developments of global deforestation. Chapter one illustrates how trading in emission allowances and the purchase of offsets reduces the costs of compliance. This is applied to a situation where there is a price on carbon, and the potential for forests to contribute to climate change mitigation. Well described are the disparity in estimates of forestry's global potential to reduce emissions and the serious possible constraints on their implementation of carbon reducing projects. This is described in terms of their economic, social and political impacts.

The second chapter links the issue of the role of forests in carbon reducing strategies with the Kyoto Protocol – the international agreement reached by the United Nations Framework Convention on climate change. We are reminded that the major feature of the Kyoto Protocol is the binding targets for 37 industrialized countries and the European Community for reducing greenhouse gas (GHG) emissions. These amount to an average of five per cent against 1990 levels over the five-year period, 2008-2012. The author highlights the fact that the stages of development and implementation of the Kyoto Protocol have become a strategic issue for international relations. In this context, strengths and weaknesses of the Kyoto Protocol are discussed in this chapter. The rules for forestry in land use, land-use change and the Clean Development Mechanism (CDM) are subjected to scrutiny through reference to empirical

evidence. It is argued that the major deficiency of the CDM is omission of the reduction of deforestation and forest degradation (REDD) in developing countries. In particular it is asserted that, firstly, the credits generated by inclusion of REDD will not be as cheap and easy to come by as commentators have suggested. Secondly it is pointed out that REDD may not be amenable to generating marketable credits of sufficient volume to make a significant difference to the level of global greenhouse gas emissions.

Chapter three provides an in depth analysis of the role of forestry in voluntary carbon markets. According to the author, unlike regulated markets, where emitters have a monetary incentive to offset rather than abate emissions, (or where forestry developers have an incentive to generate emission allowances for sale), the voluntary market does not rely on legally mandated reductions to generate demand. Instead, demand is driven by public image considerations, reduction of guilt, a sense of moral obligation or all three. This chapter also shows some of the advantages of the voluntary market such as the availability of a wide range of offset products. They include lower transaction costs relative to creating certified emission reductions (CERs) and providing individuals as well as institutions and corporations with the opportunity to play a role in mitigating global warming. The markets for voluntary offsets are discussed in terms of buyers, sellers, product differentiation and volumes. Finally, more practical aspects of the credibility of forestry offsets (that is, issues of permanence and timing) are explained.

The author notes that while the loss of forests is clearly visible, a decline in biodiversity has a less apparent effect. The subtle loss of biodiversity fails to indicate the significance that fewer species in the ecosystem increases the fragility of life for all species. The fourth chapter takes up this theme by focussing on the biodiversity benefits of reforestation and avoiding deforestation. The author points out that deforestation can directly lead to biodiversity loss when animal species that live in trees no longer retain their habitat, cannot relocate, and therefore, become extinct. The author also notes that deforestation can lead certain tree species to permanently disappear, which can have a direct effect on biodiversity of plant species in this environment. The drivers of deforestation such as market failure and institutional failure are also highlighted in this chapter.

Chapter five explains how the extent of carbon absorption by forest can be measured. The natural process responsible for the accumulation of carbon in the biomass of trees is photosynthesis, which removes CO<sub>2</sub> from the atmosphere. Therefore, an understanding of the link between CO<sub>2</sub> removed and carbon sequestered in forests is important. As the author points out, given that global climate policy is predicated on limiting the increase in the concentration of greenhouse gases in the atmosphere and the rise in global temperatures, it is vitally important that the measurement of greenhouse gases abated and offset should be as accurate as possible. This chapter reviews ways by which CO<sub>2</sub> is removed from the atmosphere by growing forests. The means by which measurements are being taken and some of the case studies are provided in this chapter. This is extremely important.

Chapter six discusses forests as a source of biofuels. The discussion covers the types of biofuels, the trends in their development and the social costs of increasing their production. The author concludes by showing that greater use of biofuels as an alternative to fossil

fuels has a worrying threefold effect by threatening tropical rainforests, biodiversity and food security.

Chapter seven analyses the role of forestry in climate change policies of selected developed countries. The chapter includes reviews of national policies adopted by developed countries for the mitigation of greenhouse gases and the role of forestry within those policies. Climate change policies and forestry in the United States, the EU, Australia and New Zealand are discussed. Usefully included are post-Kyoto policies and rules for forestry in developed countries as well as policies for afforestation and deforestation by developed countries in developing countries.

The last chapter focuses on means of reducing emissions from deforestation and forest degradation. The first part discusses the mechanisms that have been proposed to account for the reduction in deforestation and forest degradation in developing countries and to reduce the risks associated with the impermanence of forests and the leakage of deforestation to other locations. It also reviews funding mechanisms that are being considered. This includes a hard look at how policies to reduce deforestation and forest degradation can be effected. In doing so it examines the political economy in which deforestation is embedded, the socioeconomic implications of reducing emissions from deforestation and forest degradation and the prospects for its effective financing and implementation.

The importance of this book lies in being one of the first comprehensive attempts to summarise major findings in the field of carbon sinks and climate change. Its value lies in its focus on answering the central questions on carbon sinks and climate change and establishing a common standard for future teaching and research. One of the key strengths of the book lies in the author's ability to successfully integrate links between different chapters. Numerous references to seminal papers and most recent developments invite the reader to expand his/her knowledge. Another useful aspect of this book is that it highlights the considerable uncertainty in the scientific understanding of the causes, magnitude and permanence of carbon sinks and climate change issues. While noting the potential for human enhancement of carbon sinks and climate change mitigation, the book recommends that methods used in the production of forests should be modified to reflect their role in absorbing CO<sub>2</sub>. The book also highlights the need for a reduction in the use of fossil fuels as solutions to the problem of reducing the concentration of greenhouse gases in the atmosphere in the long run. However, more discussion about the role of institutions, market failures – as well as government failure – would have provided a more complete picture of the policy making environment for the reader. Most institutions have both good and bad track records in addressing the issues in carbon sinks and climate change in developing as well as developed countries. The author might, therefore, have provided more balance in their analysis.

To sum up the author strongly argues that reforestation and avoiding deforestation are ways of harnessing nature to tackle global warming. The book also deals comprehensively with the present and future role of forests in climate change policy and practice. A review of the workings of carbon markets, both based on the Kyoto Protocol and voluntary participation provides a base from which to explore forestry's future role. The author's emphasis on acknowledging how foresters' idiosyncrasies can affect the design of markets for sequestered

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carbon is a welcome contribution to the literature. This timely book is essential reading for policy decision-makers and foresters alike.

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REFERENCES

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