

Climate change is occurring at an alarming rate and its adverse impacts are being felt across the globe.



A community-managed forest in Manang, Nepal (*Bhaskar Singh Karky*)

Introduction



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Background

There is a growing body of scientific evidence indicating that the earth's climate is changing rapidly. The summary of the 4th Assessment Report of Working Group 1 of the Intergovernmental Panel on Climate Change (IPCC), published in February 2007, reports 11 of the last 12 years from 1995-2006 as among the warmest years recorded since 1850 (IPCC 2007). The rise in temperature is primarily attributed to increase in greenhouse gases caused by human activities. While the 2001 Third Assessment Report (IPCC 2001a) had attributed only 66% probability that human activities are the main causes for the increase in temperature since the mid-20th century, this probability has now been raised to 90%.

Human activity systems lie at the centre of the debate and are thought to be mainly responsible for the changes observed today and those predicted in the future. Some of the activities identified as having led to increased concentrations of carbon dioxide (CO₂) in the atmosphere include those that involve: 1) burning of fossil fuels, which has increased manifold since the start of the Industrial Revolution, and 2) loss of forested areas. Climate change calls urgently for action because concentrations of greenhouse gases (GHGs) including CO₂ have reached levels well above any observed in the last million years. Even if all GHG emitting activities such as burning of fossil fuels, or deforestation were to be stopped tomorrow, the earth's surface temperature would continue to increase for another 50 years because of the time lag between emissions and the earth's response.

Much of the GHG emissions come from industrial processes, production of electricity, and transport in industrialised countries which use large amounts of fossil fuels. In many developing countries, however, there are large emissions of CO₂ from deforestation. This book, which is based on the findings of a research project entitled, 'Kyoto: Think Global Act Local', looks at reducing emissions from deforestation based on field trials in the Himalayan regions of India and Nepal.

The Role of Deforestation in Climate Change

Forests store more carbon dioxide (4500 Gt CO₂) than the atmosphere (3000 Gt CO₂) (Prentice et al. 2001). Conversion of shrub and pasture lands, agricultural fields, or degraded forests into forests leads to sequestration of CO₂ from the atmosphere to the terrestrial ecosystems, where CO₂ is stored in biomass and soil. When forested lands

are cleared or converted into other land uses such as agriculture, or urban landscapes, the carbon earlier stored in aboveground and below ground biomass, and in the soil, is released back into the atmosphere. The total amount of CO₂ released from land-use change is estimated to be 1.6 GtC per year over the 1990s (IPCC 2007), although there is a wide range of uncertainty in the estimate. World Resources Institute (2000), for example, estimates that 8 Gt CO₂ is lost annually and released in the atmosphere because of deforestation taking place in Africa, Asia, and South America. While Skutsch, et al. (2007) state that emissions from deforestation account for about a quarter of global emissions. The Stern Review (2007) puts emissions from deforestation in perspective by comparing it with other sectors. Deforestation contributes more than 18% of the global CO₂ emissions, which is more than the total emissions coming from the transport sector. Reforestation on barren lands and avoiding deforestation on lands already with forests are therefore important strategies to check land emission levels.

It is evident that the role of forests in climate change mitigation is significant, and that the carbon dynamics of forests need to be taken into account in mitigation efforts. The central theme of this book is to show that Community Forest Management (CFM) as practiced in the Himalayan regions of India and Nepal contributes to reducing emissions, even though the Kyoto Protocol does not, so far, allow for such activities to enter into the global carbon trading market.

The Kyoto Protocol: A Framework for Collective Action

Global concern to reduce concentrations of GHGs in order to mitigate global warming has led to the Kyoto Protocol (KP) in 1997, which was negotiated in Kyoto, Japan. The KP is an international treaty which builds on the United Nations Framework Convention on Climate Change (UNFCCC), itself adopted at the Earth Summit in 1992. The KP came into force only in February 2005, after Russia's ratification in November 2004. By December 2006, 169 countries responsible for 61.6% of global emissions have ratified the Protocol. Policy details of the KP are discussed in Chapter 3.

The KP is a legally binding international agreement that commits industrialised countries to reducing their emissions of six greenhouse gases (GHGs). Under this framework, a market was developed as well as a number of flexible mechanisms, of which Clean Development Mechanism (CDM) is the one which relates to activities carried out in non-industrialised countries like India and Nepal. Under the CDM, a project to reduce carbon emissions can be set up in a non-industrialised developing country, and the carbon 'saved' can be 'credited' – that is, certificates will be issued on a per tonne carbon base. Developed countries are legally bound to reduce their emissions, but in addition to taking action on this domestically, they may also purchase carbon credits from CDM projects and offset these against their own obligations, thus creating a market for carbon credits.

According to a *Times of India* report (Ranganathan 2007), the emerging global CDM market is worth US\$ 50-60 billion annually. At current prices of US\$ 12-15 per tonne of CO₂, the report adds, the CDM is worth about US\$ 40 billion for CO₂ and another

US\$ 10-20 billion for the remaining five other anthropogenic GHGs. In the first half of 2006, according to the report, approximately US\$15 billion worth of CO₂ emission credits were traded – five times more than in 2005. However, of the 1000 CDM projects which have been approved or are in the process of being approved, almost all are in the energy sector. Only one forestry project in China has been approved so far (Murdiyarso and Skutsch 2006). This publication tries to address the question of whether a broader approach to forestry for mitigating climate change would stimulate more activity in this sector.

Community-managed Forests: A Dimension Neglected in the Kyoto Protocol

Reducing deforestation is a highly cost-effective way to quickly curtail GHGs emissions (Schlamadinger et al. 2007, Stern 2007, Kauppi and Sedjo 2001) especially in lands with low opportunity costs (van Kooten et al. 2004). The Kyoto Protocol recognises the importance of the forestry sector and allows industrialised countries to take into account GHG effects from human-induced afforestation, reforestation, and deforestation in industrialised countries. Carbon credits generated from these forest management activities can be accounted to fulfill their KP commitment. But for non-industrialised developing countries the scope for carbon trading under the CDM is limited, as reducing emissions from deforestation is not credited. This is because the Protocol recognises only two forest activities: afforestation, and reforestation; afforestation, meaning planting of new tree plantations and not activities geared towards the management of existing natural forests, or towards reducing emissions by avoiding deforestation.

Estimates of emissions from global deforestation range from more than 18% of global GHG emissions (Stern 2007), to about 25% (IPCC 2000), and the vast majority of these emissions are coming from developing countries in the tropics. The Stern Report also suggests that a 50% reduction in these emissions could be achieved at an annual cost of \$5-10 billion.

Many communities in developing countries have been successful at transforming natural forests from their deteriorating state to sustainable management under a variety of programmes such as Joint Forest Management (JFM) in India, and the Community Forest Management (CFM) Programme in Nepal. Indeed over the last decade, community forestry has emerged as a new paradigm in natural resources management in non-industrialised countries. Devolution in forest resources management, as witnessed in the Himalayan region of India and Nepal, is a successful example of decentralisation and empowerment of local people. The two case studies presented in Chapters 5 and 6 illustrate this, where local communities are managing forests handed over to them and have shown themselves able to manage these forests better than the government. In addition to resources such as fuelwood, fodder, and timber extracted to meet their subsistence needs, forest cover contributes additional environmental services such as provision of water resources, and wildlife habitat. At the same time, this type of forest management results in additional carbon sequestration. In a real sense, forests provide a win-win situation, with local as well as global benefits by sequestering

carbon. Unfortunately, under current CDM arrangements of the Kyoto Protocol polluting industrialised countries cannot pay communities for this service.

The book discusses these shortcomings of the Protocol, focusing on the exclusion of forests types found in the Himalayan region and managed by the communities themselves.

Objective and Justification

The main purpose of this book is to generate awareness among professionals, researchers, and policy makers working in different parts of the greater Himalaya on the role of community-managed forests in reducing carbon emissions. A number of issues are nestled around this topic. First is the question of how to convince the global decision-making community that community forest management (CFM) can help combat global warming. The second issue is, if communities are able to claim credits for the carbon sequestered by their forests, buyers will want sufficient proof that the carbon credit is real. This will require developing a reliable and replicable cost-effective database following the IPCC guidelines. The book discusses how this could be done.

As a starting point, under the Kyoto Protocol forestry is recognised as a means of combating global warming, but in reality this is limited to two forestry activities. Forests can play this role in a number of ways: through afforestation and reforestation to increase carbon sequestration; through improved forest management, both to increase sequestration levels and to reduce emissions through conservation and protection

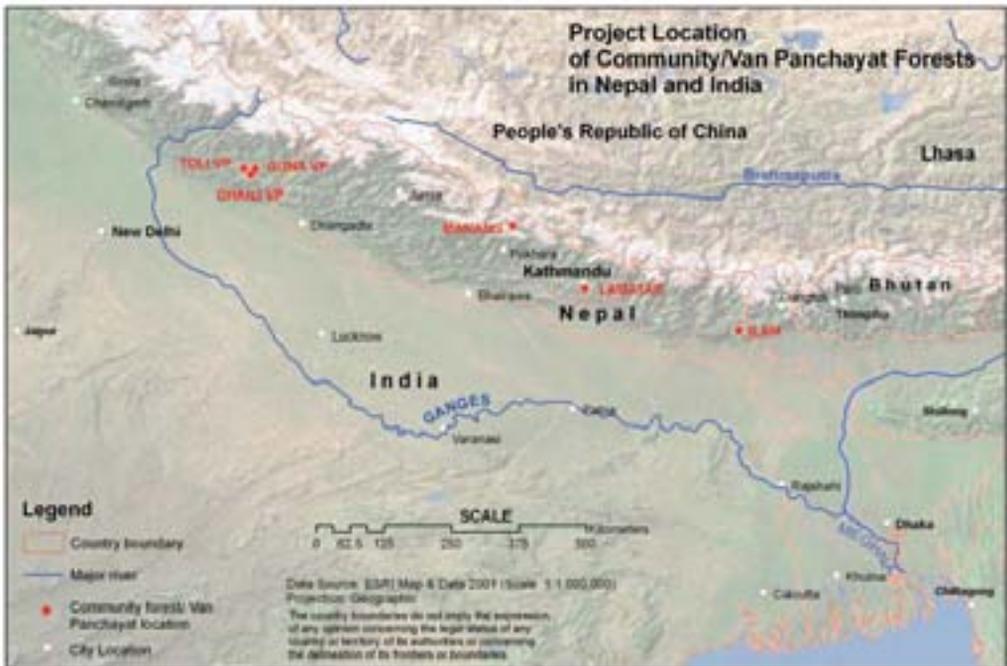


Figure 1.1: Map of the Himalayan region of western India and Nepal showing the six research sites

against deforestation; and through substitution of sustainably produced biomass for fossil fuels to cut emissions. The book lobbies for the inclusion and recognition of CFM under climate change regimes in payment for global benefits rendered.

The book reports on the work carried out by the research project, 'Kyoto: Think Global, Act Local', which aims to bring local sustainable forest management projects under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. It draws on work carried out since 2003 in three sites in India, and three in Nepal. In India all the sites are in Uttarakhand state. In Nepal they are in Ilam, Laitipur, and Manang districts. The project gathered data to show that community-managed forests can play an important role in mitigating the adverse impacts of climate change by sequestering CO₂ from the atmosphere. The levels of CO₂ sequestered annually are quantified from six research sites using IPCC guidelines described in Chapter 4. This may also be the first time that the protocol for carbon assessment in the Himalayan region has been carried out.

The Research Project: 'Kyoto: Think Global Act Local'

This project is a research and capacity building programme financed by the Netherlands Development Cooperation (DGIS) and led by the University of Twente. The project is investigating the possibilities and potentials for including community management of natural forests as an eligible carbon mitigation activity under future international climate change agreements (<http://www.communitycarbonforestry.org/home.htm>).

The programme involves research teams in three regions: East Africa, West Africa, and the Himalaya, coordinating the work of local NGOs conducting experiments in villages already engaged in CFM in each region. The research is recording the extent to which CFM practices increase sequestration in existing forests and reduce emissions of carbon by avoiding deforestation. The programme aims to support developing countries by strengthening their capacity to submit such projects for financing under various climate funds in the future.

Outline of the Book

Following this introductory chapter, Chapter 2 explains the science of climate change and its adverse impacts on global ecology. It highlights some of the ecological issues in the Himalayan region. Chapter 3 deals with Kyoto Protocol policies and issues surrounding it. It details how the Protocol developed, the criteria of the CDM, the significant role forests play in maintaining climatic stability by sequestering carbon even if community-managed forests are presently excluded by the KP. The Chapter attempts to explain why community-managed forests, such as those found in the Himalayan region, remain outside of the Protocol.

Chapter 4 illustrates the IPCC methodology used for measuring forest carbon levels in collaboration with local forest users. It describes the Protocol in detail and also illustrates

how CFM is contributing to carbon storage in the form of biomass and in the soil. If these areas were not forested all those would inevitably be released into the atmosphere.

Chapters 5 and 6 present case studies from one community forest each at Dhaili Van Panchayat (VP), India, and Lamatar Community Forest, Nepal. Both these chapters highlight the process of devolution of forest management and how the locals have successfully managed their forests which were previously under government control. They also show how communities have been motivated to conserve the forests for their own benefit.

Chapter 7 concludes by summarising the issues based on findings on all the research sites including issues that need to be addressed further to improve the current Protocol and make it more inclusive. The Chapter leaves the readers with some questions that will need to be answered in time. Clearly, the issue of climate change is not only about safeguarding the environment for future generations but one, more importantly, relating to the ethics of sharing the responsibility for taking up clean measures.