PROTECTING FORESTS AND TIMBER STOCKS

R. Stringer
School of Economics and Center for International Economic Studies, Adelaide University, Australia

Keywords: *Agenda 21*, resource management, conservation, watershed protection, logging, resource degradation, timber reserves, industrial roundwood, international conventions, ecological crisis, old growth forest, plantations, economic models, forecasting, developing countries, industrialized countries, pollution, acid rain, watersheds, community forestry

Contents

Summary

The various reviews of protection measures suggest that throughout history, hunter-gatherers, cultivators, pastoralists, and urban societies have all attempted similar approaches to forest conservation. The list of measures include: placing quantitative restrictions on the amount of timber removed; restricting or prohibiting the use of specific tree species; setting aside forest areas for recuperation, as reserves or protected

areas; protecting species during important phases of their life cycle; and designating forest areas for specific types of exploitation.

In the past, empires to villages, kingdoms to fiefdoms, and local councils to national governments tended to treat forests as bounded stocks of wood that could be enhanced, maintained, or converted to improve individual, community, or national welfare. For thousands of years, these earlier approaches made use of customs, traditions, armies, or ministries to enforce forest regulations, decrees, and laws.

Governments are recognizing that sources of wood are found beyond conventional forest jurisdictions and that forest benefits and services go beyond wood. In the twenty-first century, countries are seeking to find appropriate economic policies, regulatory mechanisms, financial incentives, organizational structures, and property rights arrangements to protect timber and promote sustainable forestry practices.

Forests are recognized as complex ecosystems capable of providing a wide range of economic, social, and environmental benefits. These benefits and services are valued differently by different people and different groups in society. Local, regional, national, and international interests in forest resources also differ greatly. The shifting and sometimes conflicting expectations of forests create difficult policy challenges in attempting to protect forests and timber stocks.

1. Introduction

Concern over how the world was managing its timber and forest resources moved onto a crowded stage at the United Nations Conference on Environment and Development (UNCED) during the summer of 1992. UNCED highlighted forest protection by developing a set of "forest principles," devoting a chapter of its major publication, *Agenda 21*, to combating deforestation, and focusing on the importance of nonwood functions of forests in the Biodiversity and Climate Change Conventions. This emerging consensus on principles of sustainable forest management represented a major step in human history.

Yet, while the UNCED activities represented the most ambitious commitment of responsibilities to protect forests beyond national boundaries, attempts to conserve, manage, and protect forests and timber stocks go back thousands of years (see *History of Forestry* and *Tree Domestication and the History of Plantations*).

Records indicate that the Chinese grappled with questions of long-run sustainable timber supplies in the fourth century BC. In India and Sri Lanka, rulers began establishing forest preserves, controlling cutting, and regulating hunting more than two thousand years ago.

Western cultures later developed similar protective measures. The Canton of Schwyz in Switzerland passed legislation in 1343 to maintain forests for a constant supply of fuelwood and timber and for protection against avalanches. In the 1500s, German states tried to stop deforestation by imposing ordinances to regulate wood supplies; laws required households to plant hedges and dig ditches instead of building wooden fences,

forced builders to substitute bricks for wood shingles in roofs, and regulated charcoal making. Saxony called for all new houses to be built entirely of stone, and permitted only designated foresters to decide which trees to cut, even in private forests.

Current attempts at establishing effective strategies to protect forests and timber involve an array of difficult choices, as in the past. For example, while we know that clearing for crops and pasture, cutting for fuelwood, uncontrolled commercial logging, and expanding infrastructure all contribute to deforestation and forest degradation, the fundamental problem facing policymakers is how to address the underlying causes, including poverty, hunger, access to land, lack of jobs, and income-generating opportunities, and growing economic demands for forest good and services.

Twentieth century experiences show that, ironically, government policies frequently exacerbate these underlying causes, producing intense and lasting impacts on forest resources.

A growing body of literature demonstrates convincingly that taxes, terms of forest concessions, administered prices, controlled transportation of forest goods, land and tree tenure insecurity, tariff and nontariff barriers to international trade, investment incentives, agricultural sector strategies, and macroeconomic policies all affect economic motivations and management and conservation of temperate and tropical forests. In many cases, these policies directly encourage or unintentionally subsidize deforestation and degradation.

Forests are complex ecosystems capable of providing a wide range of economic, social, and environmental benefits; but these benefits and services are valued differently by different people and different groups in society.

Local, regional, national, and international interests in forest resources also differ greatly. The shifting and sometimes conflicting expectations of forests create difficult policy challenges in dealing with both the forest sector and national development.

Earlier centralized and sectoral policies often were determined by the need to generate revenue and foreign exchange for national economic development.

New national development strategies require policies that integrate forests in rural development efforts and that balance economic and environmental needs among national, local, and international interests.

Countries are seeking to find appropriate economic policies, regulatory mechanisms, financial incentives, organizational structures, and property rights arrangements to protect timber and promote sustainable forestry practices.

In many countries, the search for policies takes place alongside a wider examination of the role of government as forest managers and as landowners. This examination is prompted partly by governments' own need to optimize resource efficiency, and partly by the perceived ineffective performances of forest services.

2. An Overview of Approaches to Timber and Forest Protection

In the past, empires to villages, kingdoms to fiefdoms, local councils to national governments all tended to treat forests as bounded stocks of wood that could be enhanced, maintained, or converted to improve individual, community, or national welfare.

For thousands of years, these earlier approaches made use of customs, traditions, armies, or ministries to enforce forest regulations, decrees, and laws. Governments are recognizing that sources of wood are found beyond conventional forest jurisdictions and that forest benefits and services go beyond wood.

The more recent view of what forests are and what they contribute requires national strategies and policies to integrate forests in rural development efforts and to balance economic and environmental needs among local, national, and international interests.

Governments are searching for pragmatic forestry policy frameworks that deal coherently with both the contributions of forests to development and the organizational structures required to make better use of these contributions.

Region	Land Area (thousand ha)	Original Forest as per cent of Land Area	Current Forest as per cent of Original Forest (1996)	Total Forest Area 1990 (thousand ha)	Total Forest Area 1995 (thousand ha)	Annual change (thousand ha)
Africa	2,963,468	22.9	33.9	538,978	520,237	–3,748
Asia	3,085,414	49.1	28.2	517,505	503,001	–2,901
Oceania	849,135	16.9	64.9	91,149	90,695	–91
Europe	2,260,320	72.7	58.4	930,732	933,326	519
North America	1,838,009	59.7	77.3	453,270	457,086	763
Central America	264,835	67.2	54.5	79,812	75,018	–959
South America	1,752,925	55.6	69.1	894,466	870,594	–4,774
World	13,048,300	47.7	53.4	3,510,728	3,454,382	–11,269

Source: FAO

Table 1. Forest cover and change

2.5.The Challenge of Meeting Evolving Demands for Timber

The ever-evolving concepts and shifting priorities about how to protect forests and timber stocks place strains on national capacity to manage individual forest units. For instance, sustainability in forestry has evolved from focusing on sustained yield of timber to a much broader concept of managing ecological processes, environmental services, and economic and social goods. Like the concept of sustainable development, incorporating this broad range of values into sustainable forestry management is appealing but difficult in practice.

In addressing the wide spectrum of priorities among local, national, regional, and global perspectives and responding to interest groups which often have competing objectives, tradeoffs are inevitable. Critically important issues of equity and morality arise when the interests and welfare of local communities, with limited options and capacity to find alternatives for their subsistence, differ with national or international priorities. Consulting with and then compensating those poorly served by the priorities selected are essential; the public must be involved in setting priorities.

For all these reasons, governments are challenged to accommodate people's needs with national and global interests; to use protection strategies that determine forest conditions in ways that help improve opportunities for people and communities; and to better understand how interactions among sectoral policies and macropolicies influence how people use forests and the consequences of that use on national development.

In early civilizations, timber and forest resources played a relatively simple role. Timber was needed for fuelwood, construction materials, shipbuilding, and related economic and social uses. Forests were also maintained as hunting reserves and as habitats for humans. Across time, geography and cultures, as timber was plentiful relative to demand, protection policies, rules, and laws tended to be simple and only casually enforced. As populations grew and economies expanded, forest resources often became scarce and community or national protection strategies evolved. From small communities to empires, timber protection strategies appear to have evolved from an unregulated or uncontrolled phase to a protective custody phase and then finally to a conservation phase.

The various reviews of protection measures suggest that throughout history, hunter-gatherers, cultivators, pastoralists, and urban societies have all attempted similar approaches to forest conservation. The list of measures include: placing quantitative restrictions on the amount of timber removed; restricting or prohibiting the use of specific tree species; setting aside forest areas for recuperation, as reserves, or protected areas; protecting species during important phases of their life cycle; and designating forest areas for specific types of exploitation. These various approaches to timber and forest protection may be motivated by imperial or elitist concerns such as the ancient hunting reserves of Assyria and China or by more populists concerns, such as community actions undertaken to manage timber resources as common property.

2.6. Protecting Forests as a Source for National Development

For the most part, national-level protection initiatives are of recent origins. In the early 1950s, when international attention turned to the less developed countries throughout Africa, Asia, and Latin America, no readily available conceptual model existed with which to analyze the role played by timber resources in these mostly agrarian societies. Development models described the growth and development process as a series of linear stages through which all countries must pass. The high income countries had converted much of their forests and timber to other forms of capital. Thus, many reasoned that developing countries would need to follow the same path taken by the world's richer nations in their transformation from agrarian to industrialized economies.

Forests and the role timber can contribute received little or no attention in these initial development models. In general, forests were viewed as a source of land to be converted to more productive uses. While timber could also be a source of revenue and foreign exchange, forests were seen as relatively unimportant in the struggle to promote economic development. Forest industries other than pulp and paper were considered too small to be significant for industrialization efforts.

International donors ignored the forestry sector relative to other activities. The World Bank did not establish a policy paper on forestry development until 1978. Between 1949 and 1968, it funded only two forestry projects in developing countries—a chemical pulp and newsprint mill in Chile and a paper mill in Bangladesh. During this same period, lending for land colonization projects, dam construction, road building, and related development projects resulted in the removal of forests. The World Bank's first forestry loan, focusing on soil conservation and watershed management, was made in 1980.

This conventional approach to forestry was challenged in the 1960s with an international strategy developed when a team of foresters lead by Westoby argued that those responsible for setting development priorities were unaware of the potential contribution of forests to industrial-based development. The strategy drew on concepts of growing points, lagging regions, and backward and forward linkages to demonstrate how timber resources and forests (as natural capital) could play a more vital role in promoting economic growth. The study helped attract international attention to the forestry sector. Over the next decade, the frequency and funding for forestry projects increased substantially, and projects were more carefully prepared, documented, and justified than in the past.

The widespread use of national-level forest protection strategies began after 1970, when widely held public opinion suggested that countries were just cashing in their forests. The evidence supported these perceptions. For example, a frequently cited study by the International Tropical Timber Organization (ITTO) asserts that less than 1 million ha of tropical forests out of the 828 million ha within ITTO member countries were under sustained yield management in the mid-1980s. FAO estimates that more than 15 million ha of tropical forests were lost each year during the 1980s. In addition, the FAO reports that the area of severe forest degradation is perhaps even larger than the area of forest depletion.

The general perception is that commercial logging is the major cause of accelerating tropical deforestation and temperate forest degradation. Critics point to the lack of

attention paid to forest values other than timber, including the value of wilderness, wildlife, nonwood products, environmental services, ecological linkages, and biological diversity. When logging operations conflict with these values, people believe forestry policies favor the timber industry. This growing public concern for the natural environment and discontent about how forests are managed increased pressure to develop policies that address the multiple and competing demands on forest resources.

2.7. Protecting Forests for Local Communities

Significant changes to forest and timber protection measures began as growing awareness of how local communities control and depend on forests prompted efforts to strengthen local forest management, programs, and activities. New types of cooperative activities emerged between local communities and national governments, including community forestry, farm forestry, joint forest management, and small-scale forestry enterprises. These activities highlighted the role of forests in broader rural development. The importance of forests to local communities led governments, Non-Governmental Organizations (NGOs), and international aid donors to consider a variety of rights, obligations, incentives, and supports that would motivate people to invest in growing and managing forests and timber resources.

Countries throughout the world paid greater attention to local interests in forests and the capacity of communities to manage them alongside national interests. They experimented with new structures, rules, and property forms to enhance the productivity of forests, to protect environmental qualities, and to empower rural communities to use forest resources for economic and social needs. As these various interests and objectives were not necessarily compatible, they were destined to expand rather than resolve contentious forest issues.

By the late 1970s, changes in the overall concept of economic development had created a new role for forestry. Experience revealed that development assistance strategies focused solely on promoting industrialization were not working satisfactorily. Poverty increased steadily in many countries, even though their economies expanded at a strong pace. To address this dilemma, development experts turned their attention to poverty reduction, employment generation and improved equity. Furthermore, policymakers began to recognize that natural resource degradation seriously impedes economic development and poverty alleviation. Sustainability gradually emerged as the major development principle. At the same time, natural resource and environmental economics flourished, strengthening analytical techniques and enhancing macroeconomic development models.

-
-
-

Bibliography

Barbier E. (1994) *The Economics of the Tropical Timber Trade*. London: Earthscan. [Barbier outlines the forces behind deforestation and the role that trade can play in solving degradation and deforestation.]

FAO (1993). *The Challenge of Sustainable Forest Management*. Rome: FAO. [This book is aimed primarily at a nontechnical audience and is an excellent resource for understanding the concept of sustainability applied to timber and forest management.]

Laarman J.G. and Sedjo R.A. (1992). *Global Forests: Issues for Six Billion People*. New York: McGraw-Hill. [A highly accessible overview and analysis of forest issues.]

Repetto R. (1990) Deforestation in the Tropics. *Scientific American* **262**(4). [Repetto explains the importance and role economic policies play in protecting and degrading forest resources.]

Unasylva. Rome: FAO. [*Unasylva*, an international journal of forestry and forest industries published quarterly in English, French, and Spanish, contains articles on all aspects of forestry: policy and planning; conservation and management of forest based plants and animals; rural socioeconomic development; species improvement; industrial development; international trade and environmental impact.]

Westoby J. (1989). *Introduction to World Forestry: People and Their Trees.* Oxford: Basil Blackwell. [Westoby provides a broad overview of the role forests and timber play in human societies, and how humans have managed trees and timber through time.]

World Wide Fund for Nature. *WWF Global Annual Forest Report*. [Highlights the progress made in forest conservation by WWF and its partners each year. The report includes detailed regional summaries of WWF's conservation work and images of forests and forest-related issues.]

Biographical Sketch

Randy Stringer, Ph.D., is the Deputy Director, Centre for International Economic Studies, and School of Economics, University of Adelaide. Over the past twenty-five years, he has taught, published, and conducted applied research and policy analysis on forestry, food and agriculture, water resource use, land tenure, and environmental issues in Australia, Asia and the Pacific, Africa, Europe, the Near East, and Latin America. From 1983 to 1989, Dr. Stringer was an Associate Research Scientist and Lecturer in agricultural and development economics at the University of Wisconsin's Land Tenure Center. From 1990 to 1996, he worked as an economist with the United Nations Food and Agriculture Organization, Policy Analysis Division, in Rome.