Forestry in a Shrinking Globe

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Forestry in a Shrinking Globe

INTRODUCTION

Foresters are in the midst of the most challenging international period of their lifetimes. As the world shrinks at a rate never before experienced, forestry issues have reached a level of unprecedented prominence on the global agendas of presidents and prime ministers, legislators, the news media, international organizations, land managers, and even the general public. Worldwide concern over possible global warming, tropical deforestation, loss of biological diversity, and acid rain has thrust foresters into an arena which is unfamiliar to many. Foresters have an opportunity to contribute to an improved quality of life of a global society like never before. And in the process, they will learn much of immediate benefit to programs close to home. What are the key international forestry issues? How can foresters contribute? How can we learn? Here are some of my thoughts.

GROWING AWARENESS

Since about the mid-1900's, forestry and related natural resource issues have become a subject of interest of the world's highest decision makers. Some of the more notable evidence of this is:

In February 1986, French President Mitterrand convened a ministerial level meeting in Paris to address deforestation and forest decline in Africa and Europe. It was attended by 8 heads of state or government, 3 prime ministers, and numerous ministerial delegations from around the world. It was probably the greatest outpouring of political will and support for the plight of forests ever recorded.

In 1987, the Food and Agricultural Organization (FAO) of the United Nations, the World Bank, the United Nations Development Program, and the World Resources Institute consolidated jointly issued a global Tropical Forestry Action Plan (TFAP) as a framework for harmonizing an international response to tropical deforestation (FAO, 1987). Although earlier versions of the TFAP had been issued, this was the first to consolidate the views of these four organizations. The TFAP has been discussed at the highest levels of government worldwide. It is the single best plan for facilitating cooperation among foresters and others to promote sustainable development and protection of tropical forests.

In 1983 the General Assembly of the United Nations established the World Commission on Environment and Development under the leadership of Gro Harlem Brundtland, Prime Minister of Norway, to reexamine the world's most critical environment and development problems and to formulate a global agenda for sustainable development by the year 2000. The Commission's report, "Our Common Future", was issued in 1987. It has raised considerable interest around the world and discusses many issues of relevance to global forestry.

In the past two sessions of the U.S. Congress, more than a dozen bills have been introduced that address international environmental issues such as global warming, tropical forests, biological diversity, etc. Three of those bills would specifically authorize the USDA Forest Service to maintain an active international program of technical assistance, training, cooperative research, scientific exchange, and support to international organizations. Although none of these have yet passed both houses of Congress and been signed into law, they do indicate significant interest by legislators in international forestry.

A substantial portion of the Economic Summit Conference held in Paris in July of 1989 dealt with the global environment. The conference is held nearly annually to provide a forum for the heads of government of the world's leading industrialized nations to discuss the major economic issues of the times. At this last meeting, the global environment, including forestry, was a subject of major debate. Among other things, they proposed a study of the state of the world's forests, which is to be undertaken by FAO.

Never before has the global environment, including forestry, reached the highest levels of so many governments. The concerns are indeed presidential. Following is an overview of some of the issues and opportunities where foresters can contribute.
Tropical Forests

Long viewed as far-away jungles, tropical forests are now of direct concern to the United States and other temperate zone countries. Concern stems from the accelerated rate of forest loss and degradation and the resulting impact on people and the environment, both locally and globally. Already it is thought that over half the tropical forests have been lost, and the rest are disappearing quickly. In 1900, FAO estimated that 28 million acres (the size of Pennsylvania) of tropical forests were being lost annually as a result of shifting agriculture, fuelwood gathering, conversion to pastures and row crops, and poor logging practices. Another 9 million acres were being seriously depleted and degraded, but remained as forests. Many believe that the rate of tropical deforestation has increased since the FAO survey.

Clearing and degradation of tropical forests is leading to critical ecological and socioeconomic repercussions. Tropical soils unprotected by a vegetative cover are eroding at an ever increasing rate. Sediment collects in reservoirs where the water storage capacity for irrigation is reduced and hydroelectric output decreased. Flooding is commonplace. In the semiarid regions, desertification is on the rise. Over 500 million families are affected. By the year 2000, as many as 2.8 billion people may suffer from fuelwood shortages (FAO, 1987). The impact of deforestation on food production is alarming. This had been most vividly evident in Ethiopia, but, sadly, such problems are not unique to that country. In Africa, and throughout much of the tropics, the natural resource base is badly deteriorating and being exacerbated by drought; economies are slumping; and food is in short supply. Deforestation cannot account for all of these ills, but where it is not the root cause, it is often a contributing factor. In sum, people are undergoing severe hardships and even dying, in large part because of the misuse of renewable natural resources, including forests.

The impacts of tropical deforestation reach far beyond tropical latitudes. Worldwide, there is alarm over the daily loss of plant and animals species and other reductions in biological diversity in the tropics. The ability of the tropics to produce pharmaceuticals and a host of food and fiber products for future generations may be seriously limited, and the loss of tropical overwintering areas for wildfowl common to the temperate regions could threaten their existence. Carbon released from tropical forest clearing and burning is a major component of atmospheric carbon dioxide and methane, which are thought to contribute to global warming. Repercussions of global warming could be overwhelming to life as it is now known. Even the global economy is impacted, as debtor nations become unable to repay development loans and are in greater need of aid. Although tropical deforestation alone is not responsible for all these problems, it is a major contributor and is now recognized as being one of the world’s most critical concerns. Every country of the world is affected. There is an urgent need to act now to better protect and manage remaining tropical forests and to accelerate the reforestation of already degraded areas so that they can contribute their full potential to sustainable economic development and environmental stability.

Tropical deforestation is an extremely complex problem. It is driven by population explosion, poverty, inappropriate or inadequate government policies on land distribution and incentives, debt, low agricultural productivity, and weak institutions (FAO, 1987). Foresters alone, therefore, will not reverse the deforestation trend. We do, however, have much to contribute, especially in research, extension, training, planning, and management. Perhaps the single most important contribution of foresters, however, will be to develop and demonstrate systems of tropical forest management that are more economical than alternative land uses. Until forestry pays better than competitive practices, the deforestation battle will not be won, except perhaps in a few small parks and preserves. This will require a formidable effort of foresters from temperate and tropical regions alike for many decades.

Global Warming

Few environmental issues have raised international interest the way global warming has. Is warming occurring? If so, how serious are the impacts? What are the causes? What can be done to alleviate it? What should foresters do about it? There are no clear answers to any of these questions, but the potential
impacts of global warming are so serious as to warrant a major research undertaking.

Confirmed increases in concentrations of carbon dioxide, methane and other so-called greenhouse gases in the atmosphere have taken place since initiation of the industrial age, and are likely to continue into the next century (Joyce, et al. 1990). In theory this could cause a rise in global temperature within a few decades. Scientists debate how great the temperature rise could be, but even very small increases could be of major importance. If these predictions come true, there are likely to be dramatic changes in forest cover; agricultural practices would need to be altered; and populations living in low lying areas near the sea may need to relocate.

What can foresters do about global warming? If scientists are correct that about 80 percent of the carbon dioxide buildup stems from fossil fuel combustion and only about 20 percent from forest clearing, and gases other than carbon dioxide also may contribute to the green house effect, then clearly changed forest practices do not offer the same potential as energy conservation for reducing warming.

Nonetheless, foresters can do much to prevent or slow global warming and to mitigate its effects. Foresters can, for example, help increase the amount of carbon stored in forest ecosystems by expanding afforestation and reforestation programs. Sedjo (1989) estimates that tree plantations could postpone the carbon dioxide buildup by three to five decades, but planting would need to be at the massive scale of 1.2 billion acres, dwarfing all previous efforts. Even at a smaller scale, reforestation could have an important symbolic effect and would also yield other environmental and economic benefits. Urban forestry programs can also play a major role by reducing energy demand through shading and wind protection.

Research and management can contribute much to our understanding of, and response to, global warming. Research is especially needed to predict changes in species composition, migration and other responses of forest types so that adaptive strategies can be developed. Such strategies may include breeding new varieties of trees more adaptive to stress. Forest protection and management which reduce loss to fires, insects, disease and other disturbances are also important. Indeed, forest managers and researchers are likely to be heavily involved in programs which address climate change for many years to come.

Pollution and Acidic Deposition

Air pollution respects no political borders. It has been a contentious international issue since the early 1970's, especially in Europe and North America. Although there have been many well documented cases of pollution damage to forests around specific industries, the current fury is over regional pollution, which is a much more challenging problem to forest scientists and politicians alike.

A number of regional pollutants may be damaging forests, lakes and streams, but the greatest threat appears to be from ozone and acidic deposition. Ozone has been demonstrated to cause damage to forests in southern California and Mexico, acidic deposition is much more widely spread. It is considered to be the cause of massive damage to the forests in West Germany. In North America, damage is less severe, but preliminary results from a 10-year U.S. National Acid Precipitation Assessment Program (NAPAP) indicate that acidic precipitation may be contributing to the death and reduced growth of high elevation red spruce forests in the Northeast and southern Appalachians, and to the acidification of lakes in the northeastern United States and southeastern Canada.

Acidic deposition may also be one of a number of factors contributing to forest decline. Particular concern is over the decline of pine forests in the American South and maple forests in eastern Canada. To date, however, scientists have had a difficult time quantifying the decline and, especially, of determining its causes. Stand conditions, drought, cold, insects, diseases, and other stresses in addition to acidic deposition all may be involved.

Because of its complexity and possible broad impact with obvious political repercussions, air pollution is sure to occupy the attention of foresters for many years. It will test our resolve for sustainable development, which is driven by people’s desire to have both an industrialized society and a clean environment. Foresters have a legitimate role to play in such issues, especially by providing data needed to predict and measure pollution impacts and by developing management prescriptions to mitigate the effects.
International Advances in Forest Science

A little recognized but important challenge to foresters, especially in the United States, is to benefit from scientific advances abroad. Although the American forestry profession had its origin in central Europe, and many of our first foresters were trained there, in recent decades we have tended to look inward more for scientific discovery. Too many of us have grown accustomed to searching only the English language literature, or worse yet only American journals, for published accounts of advances in forest science. Many universities exacerbate this problem by no longer requiring proficiency in a foreign language to obtain an advanced degree. Perhaps American advances in armaments and space technology since World War II have contributed to this provincial view of science.

International cooperation is too often confused with technical assistance. Yet, there is much to learn from other countries. In forestry we have benefitted greatly from German research on acidic precipitation, from Australian fire suppression technology, from Nordic systems of harvesting small dimension timber, from French satellite imagery, from the forest genetic resources of central Europe and elsewhere, and from pest management experience of the Soviet Union and China. Gregersen et al. (1989) estimated considerable benefits to the United States from foreign research on structural particle board and containerized forest tree seedlings.

There is also much to learn from tropical regions (USDA Forest Service, 1989). Pioneering work being done on clonal forestry in Brazil and the Congo has yielded much information on genetics and stand management of relevance elsewhere. Perhaps even more significant is the work being done in many tropical countries on agroforestry, social forestry and multiple use. Tropical concepts on mixing tree crops and agriculture, involving people more in forestry programs, and trying to quantify all the multiple benefits of natural forest management are sure to find application in the United States where people are placing increasing, and often contradictory, demands on the national forests.

Conclusion

The international interest in forestry and natural resources is unlikely to wane in the near future. On the contrary, it is sure to grow unabated for some time, and the 1990's may well be the decade of the global environment. A rapidly expanding world population, expected to double to 10 billion people in about the next 35 years, will intensify the pressure on the land resource base. Provision of basic human needs and a quality life for these people will challenge foresters and others to do a better job of balancing economic development with environmental protection. A measure of our success will be how well we deal with tropical deforestation, global warming, and atmospheric pollution.

Changing political arenas will also be important. In the past few months, we have seen changes in the Soviet Union and eastern Europe that few of us imagined would occur in our lifetimes. New freedoms there, in Panama, and in Nicaragua are sure to result in the desire of those people to have scientific, cultural and economic contact with the United States. We can expect more visitors and students from those countries, more scientific exchanges and an intensification of technical cooperation. And we can expect to benefit greatly from these contacts ourselves.

Indeed, foresters are entering a new era of international challenge — one that will tax their resolve to contribute to a global society, and one that will afford them almost unlimited opportunities for professional fulfillment. For American foresters, now and in future years, a special challenge will be to tone down their view of American scientific leadership and to learn again to look abroad for ways of advancing forest practices at home, not only as a means of helping others, as noble and desirable an objective as that is.

— Dr. David Harcharik

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