COST IMPLICATIONS FOR FORESTRY

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Contents

Summary

This article provides a brief overview of analyses of the cost implications for forestry of potential global climate change, and presents some ideas on what types of economic analyses are most needed in this area.

Roundwood production and forest industries as a total will probably gain by moderate global climate warming. The economic analyses done so far on this issue are, however, rather rough and few in number.

Analyses of the costs to forestry of potential global climate change influencing non-marketed goods and services such as biodiversity, recreation, and water catchment are lacking today, and should be given emphasis.

There is in general a strong need for more comprehensive economic analyses where, in particular, demand/supply considerations and risks/uncertainties are consistently treated. From the perspective of the forest sector, it appears to be at least as important to have a more precise understanding of economic and institutional responses to climatic change as it is to improve our understanding of the biophysical responses.

1. Introduction

The debate on forests and climate change has been dominated by analyses related to the physical potential of carbon sequestration in forests. In comparison, very few economic studies have been done.

This article provides a brief overview of analyses of the cost implications for forestry of potential global climate change, and present some ideas on what types of economic analyses are most needed in this area. Its focus is on how forestry is affected by potential global climate change—the overview does not include how forestry might be used to sequester carbon and thus influence global climate change.

2. Study Overviews

2.1. Physical and Environmental Impacts

Any analysis of the cost implications for forestry of potential global climate change has to start with the physical and environmental implications. An attempt can then be made to estimate their costs.

Several studies **(see Bibliography)** exist on the environmental/physical impacts on forestry of potential global climate change. As an overview, the following issues are important:

- Even a relatively small change of climate, in the order of 1ºC in annual average temperature, can cause changes in the growth and regeneration capacity of trees.
- Slow-growing species are more vulnerable to changes in climate than are fast-growing and more mobile species.
- Stands in extreme conditions of water availability (i.e. stands prone to drought or waterlogging) are particularly susceptible to changes in climate, at least if the direction of change pushes the environment further towards that particular extreme.
- The greatest impacts of possible greenhouse warming on forests are likely to occur in the boreal region, because warming is expected to be particularly large at high latitudes. Northern treelines in the Northern Hemisphere are likely to advance slowly further north on areas that are covered by tundra at present.
- Putting climate change into a perspective in the tropics, human-induced deforestation will be much more important than changes in climate and atmospheric chemistry in affecting the availability of forest products, at least until the middle of the twenty-first century, because of the use of fossil fuels and corresponding increases of the atmospheric concentration of carbon dioxide (CO_2).
- The growth of individual stands increased over the twentieth century in central Europe. However, in conditions where there is a deficiency of other growth-limiting factors, such as nutrients, it is possible that the increasing CO_2 will have no impact on forest growth. Nutrients in general are not deficient in central Europe. On the contrary, the availability of nitrogen in particular has increased because of human-induced emissions.
- Farquhar has made observations and collected ideas that finally can be useful in understanding the direct fertilizing effect of CO_2 on forest productivity at landscape level. Based on his reasoning, forest growth can be expected to increase in dry regions of the global landscape, as water-use-efficiency for individual plants is almost directly proportional to the level of CO_2 for a given regime of

temperature and humidity.

- The main risk in the boreal forests is associated with forest fires. According to Kurz and Apps, if temperature increases, fire frequency in the boreal region is likely to increase. In the 1980s, 25–30 million hectares of boreal forests burned in Canada alone.
- Potential global climate change could have severe impacts on forest biodiversity.

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Biographical Sketch

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