The recent recognition of a link between increasing rates of deforestation and increasing global climatic warming has focused new attention on the ecological role of forests. Deforestation threatens the continued existence of forests, and their loss would lead to an immediate, irreversible destabilization of the climate because the destruction of forests contributes to increased atmospheric concentrations of such heat-trapping gases as carbon dioxide and therefore to the acceleration of global warming.

The world is at present accumulating carbon dioxide in the atmosphere from two well-known sources the combustion of fossil fuels and deforestation. Deforestation results in higher levels of carbon dioxide in the atmosphere because the carbon stored in plants and trees is released when trees decay or are burned. A third sources, the warming-enhanced decay of organic matter in forests and soils, especially in the middle and higher latitudes, is now being recognized as potentially significant. Evidence is accumulating that carbon from this source is beginning to have global effects. Thus, two of the three sources of carbon dioxide in the atmosphere are directly related to the survival and health of forests.

In the discussion about the importance of forests, however, emphasize has fallen on biodiversity, or numbers of species per unit area, especially in the tropics, where such diversity is particularly high. But forests, it should be emphasized, have a similar role in every latitude they contain the largest numbers of different kinds of plants and animals of any community on land and might be considered the most highly developed of the terrestrial communities from the standpoint of complexity of structure and diversity of life and life forms. Forests are far more than simple collections of species, however, it is unfortunate that the discussion of biotic or living resources has been focused on biodiversity rather than on the actual ability of the land itself to support life. In order for the complete range of plant and animal life to thrive, the soil must contain essential nutrients in their proper quantities and proportions, and the atmosphere must be composed of the correct molecules in their proper proportions. If the soils were to become infertile and the atmosphere inhospitable, more than mere diversity or numbers of species would be lost, the land would become impoverished and no longer be able to support any life.

Deforestation almost invariably speeds up the loss of nutrients into watercourses. It also, as previously explained, involves a release of carbon into the atmosphere. Forests thus play a clear and critical role in helping to protect the capacity of the land to support life by increasing the retention of nutrients and in helping to stabilize the atmosphere by storing carbon.