Reducing greenhouse gases may not be enough to slow climate change

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Georgia Tech City and Regional Planning Professor Brian Stone publishes a paper in the December edition of Environmental Science and Technology that suggests policymakers need to address the influence of global deforestation and urbanization on climate change, in addition to greenhouse gas emissions.

According to Stone's paper, as the international community meets in Copenhagen in December to develop a new framework for responding to climate change, policymakers need to give serious consideration to broadening the range of management strategies beyond greenhouse gas reductions alone.

"Across the U.S. as a whole, approximately 50 percent of the warming that has occurred since 1950 is due to land use changes (usually in the form of clearing forest for crops or cities) rather than to the emission of greenhouse gases," said Stone. "Most large U.S. cities, including Atlanta, are warming at more than twice the rate of the planet as a whole - a rate that is mostly attributable to land use change. As a result, emissions reduction programs - like the cap and trade program under consideration by the U.S. Congress - may not sufficiently slow climate change in large cities where most people live and where land use change is the dominant driver of warming."

According to Stone's research, slowing the rate of forest loss around the world, and regenerating forests where lost, could significantly slow the pace of global warming.

"Treaty negotiators should formally recognize land use change as a key driver of warming," said Stone. "The role of land use in global warming is the most important climate-related story that has not been widely covered in the media."

Stone recommends slowing what he terms the "green loss effect" through the planting of millions of trees in urbanized areas and through the protection and regeneration of global forests outside of urbanized regions. Forested areas provide the combined benefits of directly cooling the atmosphere and of absorbing greenhouse gases, leading to additional cooling. Green architecture in cities, including green roofs and more highly reflective construction materials, would further contribute to a slowing of warming rates. Stone envisions local and state governments taking the lead in addressing the land use drivers of climate change, while the federal government takes the lead in implementing carbon reduction initiatives, like cap and trade programs.

"As we look to address the climate change issue from a land use perspective, there is a huge opportunity for local and state governments," said Stone. "Presently, local government capacity is largely unharnessed in climate management structures under consideration by the U.S. Congress. Yet local governments possess extensive powers to manage the land use activities in both the urban and rural areas."

More information: The Environmental Science and Technology article is available at pubs.acs.org/journal/esthag .

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