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## Biofuels Deemed a Greenhouse Threat

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Almost all biofuels used today cause more greenhouse gas emissions than conventional fuels if the full emissions costs of producing these “green” fuels are taken into account, two studies being published Thursday have concluded.

The benefits of biofuels have come under increasing attack in recent months, as scientists took a closer look at the global environmental cost of their production. These latest studies, published in the prestigious journal *Science*, are likely to add to the controversy.

These studies for the first time take a detailed, comprehensive look at the emissions effects of the huge amount of natural land that is being converted to cropland globally to support biofuels development.

The destruction of natural ecosystems — whether rain forest in the tropics or grasslands in South America — not only releases greenhouse gases into the atmosphere when they are burned and plowed, but also deprives the planet of natural sponges to absorb carbon emissions. Cropland also absorbs far less carbon than the rain forests or even scrubland that it replaces.

Together the two studies offer sweeping conclusions: It does not matter if it is rain forest or scrubland that is cleared, the greenhouse gas contribution is significant. More important, they discovered that, taken globally, the production of almost all biofuels resulted, directly or indirectly, intentionally or not, in new lands being cleared, either for food or fuel.

“When you take this into account, most of the biofuel that people are using or planning to use would probably increase greenhouse gasses substantially,” said Timothy Searchinger, lead author of one of the studies and a researcher in environment and economics at Princeton University. “Previously there’s been an accounting error: land use change has been left out of prior analysis.”

These plant-based fuels were originally billed as better than fossil fuels because the carbon released when they were burned was balanced by the carbon absorbed when the plants grew. But even that equation proved overly simplistic because the process of turning plants into fuels causes its own emissions — for refining and transport, for example.

The clearance of grassland releases 93 times the amount of greenhouse gas that would be saved by the fuel made annually on that land, said Joseph Fargione, lead author of the second paper, and a scientist at the [Nature Conservancy](#). “So for the next 93 years you’re making [climate change](#) worse, just at the time when we need to be bringing down carbon emissions.”

The Intergovernment Panel on Climate Change has said that the world has to reverse the increase of greenhouse gas emissions by 2020 to avert disastrous environment consequences.

In the wake of the new studies, a group of 10 of the United States's most eminent ecologists and environmental biologists today sent a letter to President Bush and the speaker of the House, [Nancy Pelosi](#), urging a reform of biofuels policies. "We write to call your attention to recent research indicating that many anticipated biofuels will actually exacerbate global warming," the letter said.

The European Union and a number of European countries have recently tried to address the land use issue with proposals stipulating that imported biofuels cannot come from land that was previously rain forest.

But even with such restrictions in place, Dr. Searchinger's study shows, the purchase of biofuels in Europe and the United States leads indirectly to the destruction of natural habitats far afield.

For instance, if vegetable oil prices go up globally, as they have because of increased demand for biofuel crops, more new land is inevitably cleared as farmers in developing countries try to get in on the profits. So crops from old plantations go to Europe for biofuels, while new fields are cleared to feed people at home.

Likewise, Dr. Fargione said that the dedication of so much cropland in the United States to growing corn for bioethanol had caused indirect land use changes far away. Previously, Midwestern farmers had alternated corn with soy in their fields, one year to the next. Now many grow only corn, meaning that soy has to be grown elsewhere.

Increasingly, that elsewhere, Dr. Fargione said, is Brazil, on land that was previously forest or savanna. "Brazilian farmers are planting more of the world's soybeans — and they're deforesting the Amazon to do it," he said.

International environmental groups, including the United Nations, responded cautiously to the studies, saying that biofuels could still be useful. "We don't want a total public backlash that would prevent us from getting the potential benefits," said Nicholas Nuttall, spokesman for the United Nations Environment Program, who said the United Nations had recently created a new panel to study the evidence.

"There was an unfortunate effort to dress up biofuels as the silver bullet of climate change," he said. "We fully believe that if biofuels are to be part of the solution rather than part of the problem, there urgently needs to be better sustainability criterion."

The European Union has set a target that countries use 5.75 percent biofuel for transport by the end of 2008. Proposals in the United States energy package would require that 15 percent of all transport fuels be made from biofuel by 2022. To reach these goals, biofuels production is heavily subsidized at many levels on both continents, supporting a burgeoning global industry.

Syngenta, the Swiss agricultural giant, announced Thursday that its annual profits had risen 75 percent in the last year, in part because of rising demand for biofuels.

Industry groups, like the Renewable Fuels Association, immediately attacked the new studies as "simplistic," failing "to put the issue into context."

"While it is important to analyze the climate change consequences of differing energy strategies, we must all remember where we are today, how world demand for liquid fuels is growing, and what the realistic alternatives are to meet those growing demands," said Bob Dineen, the group's director, in a statement

following the Science reports' release.

“Biofuels like ethanol are the only tool readily available that can begin to address the challenges of energy security and environmental protection,” he said.

The European Biodiesel Board says that biodiesel reduces greenhouse gasses by 50 to 95 percent compared to conventional fuel, and has other advantages as well, like providing new income for farmers and energy security for Europe in the face of rising global oil prices and shrinking supply.

But the papers published Thursday suggested that, if land use is taken into account, biofuels may not provide all the benefits once anticipated.

Dr. Searchinger said the only possible exception he could see for now was sugar cane grown in Brazil, which take relatively little energy to grow and is readily refined into fuel. He added that governments should quickly turn their attention to developing biofuels that did not require cropping, such as those from agricultural waste products.

“This land use problem is not just a secondary effect — it was often just a footnote in prior papers.” “It is major. The comparison with fossil fuels is going to be adverse for virtually all biofuels on cropland.”

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