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Biofuel farms make CO2 emissions worse

- Land conversion increases greenhouse gases - study
- Carbon debt may take centuries to pay off

Alok Jha, science correspondent
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Transforming ecosystems into farms for biofuel crops will increase global warming and result in net increases in carbon emissions, according to a study.

Scientists have found that converting rainforests, peatlands and grasslands can outweigh the carbon savings made from biofuels and produce "carbon debts" which could take centuries to pay off.

The study will add to concerns about the ability of biofuels to replace fossil fuels. The EU is reviewing its pledge that biofuels such as bioethanol and biodiesel should make up 10% of transport fuel by 2020. Britain has a separate target of 5% biofuels in petrol and diesel by 2010.

In the study, US researchers calculated that converting natural ecosystems to grow corn or sugarcane to produce ethanol, or palms or soybeans for biodiesel, could release between 17 and 420 times more carbon than the annual savings from replacing fossil fuels.

This is due to the carbon contained in the original plants and soils which is released as CO₂ when the vegetation rots after it is cleared. The researchers said this carbon debt must be paid before biofuels produced on the land could count towards reducing greenhouse gas emissions.

"This research examines the conversion of land for biofuels and asks the question 'Is it worth it?'" said Joe Fargione, a scientist for the environmental group The Nature Conservancy. "Does the carbon you lose by converting forests, grasslands and peatlands outweigh the carbon you 'save' by using biofuels instead of fossil fuels? And surprisingly, the answer is no."

In Indonesia the researchers found that converting land for palm oil production ran up the worst carbon debts, requiring 423 years to pay off. Producing soybeans in the Amazon would take 319 years of soy biodiesel to offset the carbon debt.

Stephen Polasky of the University of Minnesota, one of the authors of the study, published today in the journal *Science*, said: "We don't have proper incentives in place because landowners are rewarded for producing palm oil and other products but not rewarded for carbon management. This creates incentives for excessive land clearing and can result in large increases in carbon emissions."

Fargione said all biofuels now in use destroyed habitats. "Producing food-based biofuel will require that still more land be converted to agriculture," he said. The team also identified biofuels which did not contribute to global warming, including agricultural waste and grasses grown on land not suitable for crops.

"Biofuels made on perennial crops grown on degraded land that is no longer useful for growing food crops may actually help us fight global warming," said Jason Hill of the University of Minnesota, who also took part in the study. "One example is ethanol made from diverse mixtures of native prairie plants."

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