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Burning biofuels may be worse than coal and oil, say experts

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Alok Jha, science correspondent
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Using biofuels made from corn, sugar cane and soy could have a greater environmental impact than burning fossil fuels, according to experts. Although the fuels themselves emit fewer greenhouse gases, they all have higher costs in terms of biodiversity loss and destruction of farmland.

The problems of climate change and the rising cost of oil have led to a race to develop environmentally-friendly biofuels, such as palm oil or ethanol derived from corn and sugar cane. The EU has proposed that 10% of all fuel used in transport should come from biofuels by 2020 and the emerging global market is expected to be worth billions of dollars a year.

But the new fuels have attracted controversy. "Regardless of how effective sugar cane is for producing ethanol, its benefits quickly diminish if carbon-rich tropical forests are being razed to make the sugar cane fields, thereby causing vast greenhouse-gas emission increases," Jörn Scharlemann and William Laurance, of the Smithsonian Tropical Research Institute in Panama, write in Science today.

"Such comparisons become even more lopsided if the full environmental benefits of tropical forests - for example, for biodiversity conservation, hydrological functioning, and soil protection - are included."

Efforts to work out which crops are most environmentally friendly have, until now, focused only on the amount of greenhouse gases a fuel emits when it is burned. Scharlemann and Laurance highlighted a more comprehensive method, developed by Rainer Zah of the Empa Research Institute in Switzerland, that can take total environmental impacts - such as loss of forests and farmland and effects on biodiversity - into account.

In a study of 26 biofuels the Swiss method showed that 21 fuels reduced greenhouse-gas emissions by more than 30% compared with gasoline when burned. But almost half of the biofuels, a total of 12, had greater total environmental impacts than fossil fuels. These included economically-significant fuels such as US corn ethanol, Brazilian sugar cane ethanol and soy diesel, and Malaysian palm-oil diesel. Biofuels that fared best were those produced from waste products such as recycled cooking oil, as well as ethanol from grass or wood.

Scharlemann and Laurance also pointed to "perverse" government initiatives that had resulted in unintended environmental impacts. In the

US, for example, farmers have been offered incentives to shift from growing soy to growing corn for biofuels. "This is helping to drive up global soy prices, which in turn amplifies economic incentives to destroy Amazonian forests and Brazilian tropical savannas for soy production."

They added: "The findings highlight the enormous differences in costs and benefits among different biofuels. There is a clear need to consider more than just energy and greenhouse gas emissions when evaluating different biofuels and to pursue new biofuel crops and technologies."

Andy Tait, campaign manager at Greenpeace, said: "We're already bought into mandatory targets for the use of biofuels with very little thought of what the environmental impacts will be. This study further confirms that there are serious risks associated with first generation biofuels, particularly from corn, soya and palm oil."

He said that the biofuel technology had been oversold by industry and politicians. "It's clear that what government and industry are trying to do is find a neat, drop-in solution that allows people to continue business as usual.

"If you're looking at the emissions from the transport sector, the first thing you need to look at is fuel efficiency and massively increasing it. That needs to come before you even get to the point of discussing which biofuels might be good or bad."