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FOR IMMEDIATE RELEASE

‘Carbon debt’ created by some biofuels must be considered in sustainability debate, new study shows

DURBAN, South Africa (30 November, 2011) _ Despite being heralded as a green alternative to fossil fuels, a new study by the Center for International Forestry Research has found that carbon emissions generated from land conversion for biodiesel production may take decades to hundreds of years to reverse in some cases, raising serious questions about biodiesel sustainability. This large variation is the result of the type of land converted and the productivity of the feedstock crop.

Published work by CIFOR and others suggests the need for a “full life-cycle analysis” that takes into account the carbon debt of land use change to become commonplace when assessing the environmental benefit of biofuel usage.

“It really matters how you produce biofuels and what land you grow it on as to whether you are going to get climate change benefits,” said Louis Verchot, CIFOR scientist and co-author of [Implications of Biodiesel-Induced Land-Use Changes for CO2 Emissions: Case Studies in Tropical America, Africa, and Southeast Asia](#) published in a special feature of *Ecology and Society*.

“Biofuels that result in the conversion of natural ecosystems are never going to be emission efficient. This study argues for appropriate spatial planning and being aware that anything that you do in the name of the atmosphere could have unanticipated consequences unless you look at the whole production system.”

Fluctuating oil prices and growing concerns about climate change have led to a renewed commitment to renewable energy, with demand for biofuels such as those produced from palm oil, jatropha and soy increasing in recent years.

However despite their potential for climate mitigation, biofuels have been receiving growing negative attention because their expansion often leads to deforestation, negative social impacts for customary land users such as loss of land and labor rights, threats to food security, and high carbon emissions from land use change.

To quantify the atmospheric effects on biofuel-related changes in land use, CIFOR scientists examined actual case studies for the production of three biodiesel and multi-purpose feedstocks in sites in Asia, Africa and Latin America. They calculated emissions from both direct land use change (land clearing for making fields), and assessed plausible ranges to anticipate indirect land use change (when production of biofuels pushes other agricultural activities further into natural ecosystems).

These emissions were considered to be the “carbon debt” that was created in the biofuels production chain and this debt must first be repaid through reduced fossil fuel use before there could be net benefits to the atmosphere. CIFOR scientists then calculated the time it would take to repay the carbon debt of each system studied.

In most cases, the study found that significant carbon debts were created by the cultivation of biodiesel-only and multi-purpose feedstocks that would take tens to hundreds of years to restore. The best case was soybean production, for which carbon debt repayment times in some cases were less than 30 years.

The idea of carbon debt repayment is not new for biofuels. This study is the best effort so far to quantify the debt in the tropics and to look at repayment times for real world production systems. The strength of this work is in the comparisons between different feed stocks and different settings. “The take home message,” says Verchot, “is not that biofuels are bad for the atmosphere. Rather, the results point to important considerations that must be taken into account to make biofuels sustainable.”

These studies should help policy makers in producer and consumer countries alike understand what needs to be done to better guide and regulate the industry to achieve key policy aims, said Laura German, lead editor of the special issue.

“This set of papers suggests that neither rural livelihood nor climate mitigation benefits can be assumed, suggesting the need for more proactive efforts by producer and consumer country governments, industry and civil society to steer the sector in more sustainable and equitable directions.”

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The impacts and implications of biofuel expansion on forests will be discussed at a CIFOR sponsored event at the Durban Climate Change and Trade Symposium in parallel to the United Nations Conference on Climate Change COP 17 in Durban, South Africa next week. [Register here](#).

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The [Center for International Forestry Research](#) (CIFOR) advances human wellbeing, environmental conservation and equity by conducting research to inform policies and practices that affect forests in developing countries. CIFOR helps ensure that decision-making that affects forests is based on solid science and principles of good governance, and reflects the perspectives of developing countries and forest-dependent people. CIFOR is one of 15 centres within the Consultative Group on International Agricultural Research.