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Environmental policy often has undesirable side effects

"Good intentions" do not generally produce "good results". This wisdom also applies to establishing coherent environmental policies. Without proper oversight and planning, environmental policies can lead to unintended and harmful side effects. A current special issue of the journal Environmental Research Letters is devoted to this urgent problem. The guest editors are researchers from the University of Bonn and international partners.

Bioplastics is frequently understood as synonymous with green, sustainable and environmentally friendly alternatives to petroleum based plastic products. This is not the whole story, however. While is true that plastics made from corn, wheat, or sugarcane are, in principle, climate-neutral and protect declining oil reserves - a broad shift in consumption from conventional to bio-based materials could be bad news for the environment given the current state of technology. After all, plant based raw materials are produced on land and unregulated agricultural expansion often leads to the conversion of natural, such as tropical forests. This jeopardizes climate change mitigation efforts, because forests bind considerably more carbon than, for instance, corn or sugar cane plantations. Hence, the unintended consequences of promoting “green” products through ill-designed environmental policies, could potentially lead to more harm than good for the global climate, not to mention other consequences, such as rising food prices and biodiversity loss.

A number of such examples can be found in the special issue “Focus on Leakage” of the journal "Environmental Research Letters". They show that policies intended to combat climate change and environmental destruction often produce impacts that planners had not anticipated in the design phase. "It is therefore important to assess potential undesired consequences in advance and, if necessary, adjust or even pull the plug before it’s too late," emphasizes Dr. Jan Börner, who holds the Chair of Economics of Sustainable Land Use and Bioeconomy at the University of Bonn. "To this end, we have to get better at understanding how these so-called spillover effects occur and how they can be minimized. The collection of papers in this special issue contributes to this aim."

Computer models as decision aid

The cause-and-effect relationships in the global land use system are complex, however. Computer models thus represent an important tool to support policy design processes. Clearly, models of global land use dynamics do not make precise predictions. "Their accuracy is too low for that," explains Börner. "In contrast to bio-physical simulations, psychological, economic, and sociological factors dominate in human managed systems. This makes them useless as forecast tools." Nevertheless, policy simulations can show what consequences an environmental policy decision can possibly have in order to anticipate which measures are the best way to reduce undesirable side effects.

Policy design is further complicated when spillovers occur far away from where policy decisions are made. While the decision to replace fossil fuels with biogenic raw materials has an immediate positive effect on the German carbon emission balance, it also means that Germany has to import more biomass, potentially driving deforestation in regions such as South America and Southeast Asia. These dynamics have measurably increased the ecological footprint that the EU generates through its imports from other countries, as shown by a study in the special issue. Moreover, these

ecological costs usually arise in countries with weak environmental legislation. This can potentially turn a net-benefit of a well-intended environmental policy into a net-cost.

Prof. Börner calls for binding sustainability guidelines in international agreements. "We need to discuss where it is efficient to produce certain products, both from an economic and an ecological point of view and on a global level," he says. “If this means that some regions lose out economically, we must think about suitable compensation mechanisms." The current trend towards bilateral agreements has not been helpful from this perspective. "International environmental and trade agreements must engage as many parties as possible in order to deal with global impacts of local policies."

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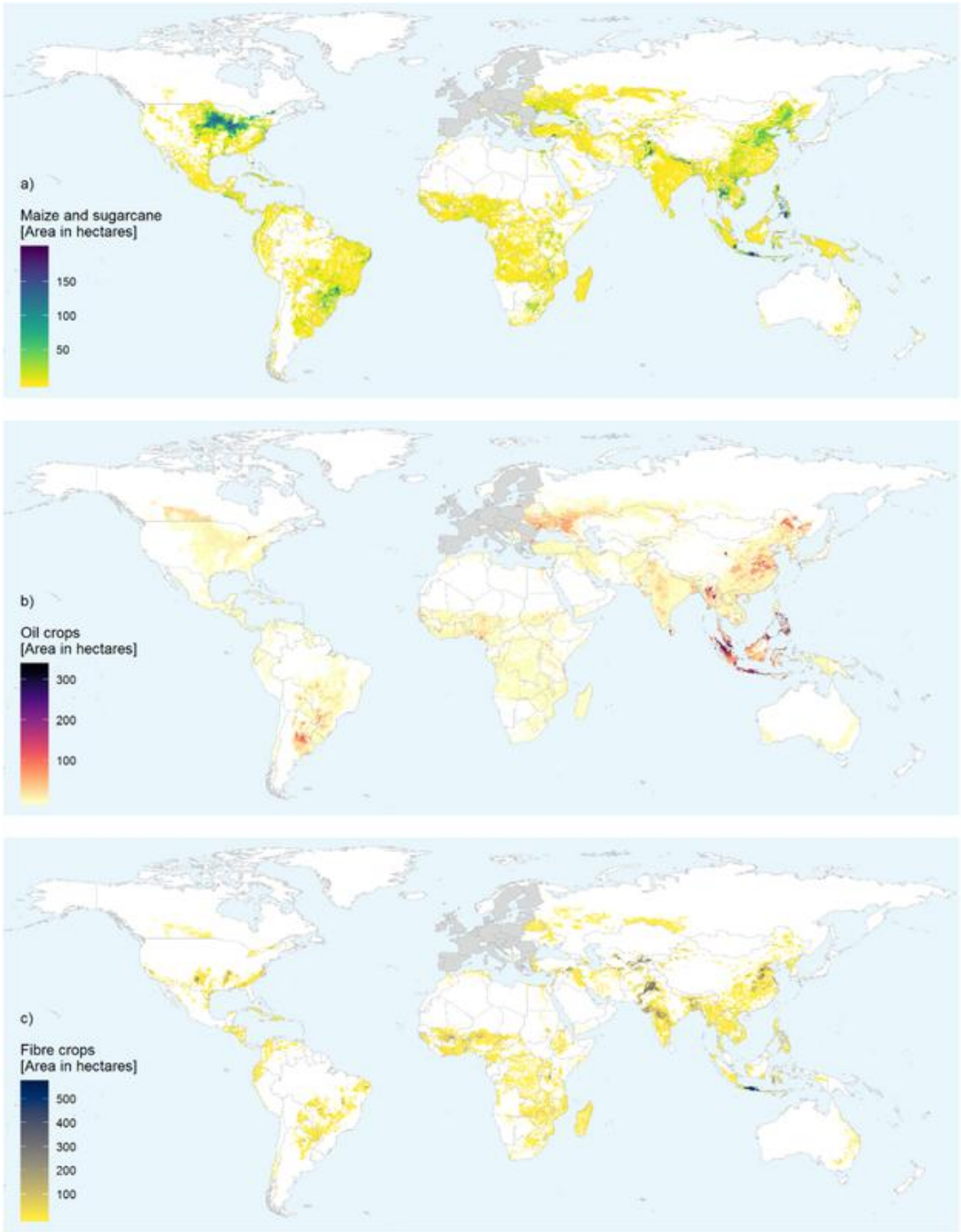
Original publication:

Focus on Leakage: Informing Land-Use Governance in a Tele-Coupled World; Environmental Research Letters;
https://iopscience.iop.org/journal/1748-9326/page/Leakage-Land-Use



The figure shows the EU's land consumption outside its borders for the cultivation of crops not intended for human consumption (a: corn/sugar cane; b: oil plants; c: fiber plants).