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Regional impacts of expansion of bioethanol production on biodiversity in Brazil

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One of the key sustainability issues related to the growing demand for bioenergy concerns the impact of large-scale biomass production on biodiversity. In Brazil, the land in use for bioethanol production is expected to expand over the next few decades, while there is a lack of adequate knowledge on the potential effects of related (indirect) land use change on biodiversity. The present study examines these effects on a regional level to gain insights in the potential impacts and key dynamics involved, which can contribute to strategies for proper land use planning. Annual maps up to 2030 of potential future land use for various policy scenarios are developed using a land use change model that spatially allocates agricultural land requirements, as projected by a macro-economic model. Subsequently, the potential impacts of land use change on biodiversity are assessed by applying various complementary methods that address different levels of biodiversity. These may include mechanistic niche-based modeling using habitat preference and species distribution data and dose-response modeling using the GLOBIO model. These methods enable including changes in agro-biodiversity and effects of land use intensification, processes that are expected to be significant for potential impacts, as has been widely discussed in the land sparing vs land sharing debate. By including and comparing various methodologies, this study aims to contribute to the development of a methodological framework for the assessment and quantification of the impact of the expansion of bioenergy production on biodiversity. The study is part of an integrated impact assessment at a regional level in which, additionally, potential impacts on socio-economic and water resources are assessed.

Biography

Michiel Nijssen is doing PhD research at the Copernicus Institute, Utrecht University, the Netherlands. He has a background in biology and sustainability science and his current research focus is on sustainable bioenergy. More specifically, he studies the potential impacts of (indirect) land use change related to expansion of bio-energy production on water and biodiversity resources.

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