

Global biodiversity impacts of Dutch industries

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Companies have impacts on the global biodiversity loss, for instance by the use of resources and emissions. By influencing their supply chains, individual companies may contribute to avert the biodiversity impacts of their activities. However, the total impacts of companies are not always clear, since supply chains are becoming more fragmented and complex due to increasing globalization and international trade. In order to support companies in taking responsibility for both their direct (company level) and indirect impacts (through their supply chains), we provide insights in the total biodiversity impact at the level of industries. This supplies information on the average impacts of industries that can be of use as benchmark for individual company calculations.

Where most studies focus on environmental pressures of industries, such as greenhouse gas emissions and land occupation, this paper goes a step further by presenting the combined impact these environmental pressures have on global biodiversity loss, which can be interpreted as a biodiversity footprint by industry. This is done for 48 industries in the Dutch economy in 2007. We quantified the relation between production and global biodiversity loss by using an environmentally-extended multi-regional input-output (MRIO) model based on data from the WIOD and GTAP databases including international trade flows. The MRIO model was used to trace the supply-chain contributions of industries in regions all over the world in terms of several biodiversity relevant environmental pressures. By extending the environmental pressures with spatial information and cause-effect relationships obtained from the GLOBIO biodiversity model, we calculated the impacts of these environmental drivers on terrestrial biodiversity. Mean Species Abundance (MSA) was used as a biodiversity indicator which is a representation of the degree of ecosystem naturalness. The MSA indicator is calculated by comparing the mean abundance of occurring species in a disturbed situation relative to their abundance in undisturbed ecosystems.

For most industries in the Dutch economy, more than 50% of the supply-chain biodiversity losses took place in other countries. The supply-chain biodiversity impacts of the food industry, which showed the highest biodiversity footprint, were for more than 90% abroad. The losses were mainly caused by land occupation for agriculture and related spatial pressures, such as fragmentation and infrastructure. The electricity and gas industry, which was second in terms of biodiversity footprint, showed a large impact on biodiversity mainly caused by greenhouse gas emissions. Primary resource producing industries, such as cattle farming, forestry and arable farming, showed the highest biodiversity footprint per euro turnover.