Science for Environment Policy

First assessment of global cropland footprint of EU’s non-food sector

To better understand the social and ecological implications of the non-food sector of the EU’s expanding bioeconomy, an economy which is based on the production and conversion of renewable biological resources into products and energy, a study has assessed the global cropland footprint of the region’s non-food products. The results show that the EU was the world’s biggest consumer and importer of these products from 1995 to 2010: two-thirds of the cropland required to satisfy the EU’s non-food consumption is located elsewhere in regions including China, the USA and Indonesia, bringing potential impacts for distant ecosystems. These findings can inform EU policymaking and support the EU Bioeconomy Strategy.

The EU Bioeconomy Strategy promotes the transition towards a bioeconomy, a transition that aims to alleviate social-environmental challenges, achieve climate and environmental targets and push for smart, green growth. However, as current EU production and consumption practices may cause land-use impacts in other parts of the world, the question arises as to how sustainable the EU’s bioeconomy is. Europe is the only global region that is a net-importer of the four largest natural resource categories: materials, water, carbon and land, so the sustainability of the bioeconomy is dependent on how that sustainability is implemented, with increased global land-use requirements of the economy being a particular risk.

Land-footprinting studies quantify the total amount of land used to produce a particular product or service on a global basis, including all secondary impacts, and so are a useful tool in national and regional sustainability assessments. While various EU policy documents acknowledge that European production and consumption patterns cause land-use related impacts abroad, the Bioeconomy Strategy does not explicitly address resource-use displacement. Key indicator systems with relevance for land, such as the Resource Efficiency Scoreboard, only focus on territorial indicators and do not take international connections into account. To enable the Bioeconomy Strategy to support global sustainable development, a detailed monitoring of land-use displacement and resulting effects is essential.

To address this gap, this study assessed the global cropland footprint of EU products in this sector. Researchers used a novel hybrid land-flow accounting model to track the demand for cropland embodied in non-food biomass flows along global supply chains, using data from 1995–2010. This enabled them to quantify and analyse the EU’s non-food cropland footprint over this period. Employing such an accounting model — one that combined two existing models: the biophysical accounting model LANDFLOW; and monetary accounting model EXIOBASE — allowed the researchers to improve the level of detail in their analysis of both products and regions, and to comprehensively cover all global supply chains.

The results reveal the development of the EU non-food products’ cropland footprint between 1995 and 2010, including its geographical and product composition. They show that two-thirds of the cropland required to meet the EU’s non-food consumption demand is located outside the region, particularly in China, the USA and Indonesia — meaning that the EU’s bioeconomy may have notable social and ecological impacts outside the region.

With oilseeds forming the highest share of the EU’s non-food cropland demand (39% in 2010; this crop is used to produce products such as biofuels, detergents and polymers. Traditional non-food biomass uses, such as fibre crops for textiles and animal hides for leather products, account for an additional 22% of demand.
First assessment of global cropland footprint of EU’s non-food sector (continued)

This highlights the increasing importance of non-food products, which are the fastest growing source of direct and indirect demand for agricultural land both in the EU and globally. It also reveals the EU to be the largest consumer and net importer of non-food products globally. The EU increasingly sources non-food biomass feedstocks from tropical regions, which have been identified as hotspots of both deforestation and biodiversity loss.

The findings of the study showed that the non-food sector is attaining a growing importance in the EU’s bioeconomy, as well as globally. If the European bioeconomy is to promote sustainable development on a global scale, tools should be put in place to monitor trade-induced land-use spillover and displacement effects emanating from EU energy, agricultural and bioeconomy policy programmes. The study concludes that environmental footprint measures, together with global environmental targets, can guide the EU as it implements the Sustainable Development Goals, and provide the data basis with which to monitor and review progress.