Comparing national Material and Land Footprints in a global perspective

Topic: Environmental IO models 3
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Natural resources on our planet are limited and therefore trends and patterns of global material consumption and land use are two key determinants for global environmental sustainability. Clear links between these two categories of resource use can be determined, most obviously for biomass use, but also for other land-intensive activities, such as mining and construction.

This paper examines the links between the global flows of materials and the amounts of materials directly and indirectly necessary to satisfy final consumption in different countries world-wide (Material Footprint) with the related demand on land areas (Land Footprint) for agricultural and forestry products. The paper applies a multi-regional input-output (MRIO) analysis which combines economic data in monetary terms (based on the GTAP data set) with physical data (material use in tonnes from SERI's global material flow database (www.materialflows.net) and land use in hectares from the FAO). The model distinguishes 112 countries and world regions and 57 economic sectors. The calculations are carried out for the year 1997 and 2004.

The paper addresses the following main questions:
• Which countries have the highest / lowest Material and Land Footprints?
• Which countries are globally the biggest net-exporters and net-importers of embodied materials and embodied land?
• How have global patterns of resource extraction, trade and consumption changed between 1997 and 2004?
• How are the impacts of per capita consumption of selected countries (such as Germany, UK, USA, China, Brazil) on the Material and Land Footprint distributed over different product groups and world regions supplying those natural resources?