

Increasing the relevance of toxicity assessment in LCA: in the need for a cross fertilization between RA and LCA

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The need to address the impact of the thousands of man-made chemicals that are released every day all over the world on natural ecosystems and human population calls for further methodological development in different science-policy fields. Few decades ago, the solution to pollution was dilution. Nevertheless, due to economic and population growth, ecosystems and people are exposed every day to multiple chemical stressors via multiple pathways and routes. Human and Environmental Risk Assessment (HERA) and Life Cycle Assessment (LCA) are two complementary science-policy fields that address chemical impacts on the environment and humans to answer different questions. While HERA focuses on the determination of the acceptable level of chemicals in the various environmental compartments and food items, the impact assessment phase of LCA aims at characterizing potential impacts on human health and the environment attributable to chemical emissions over the life cycle of products or services. HERA works on one or multiple chemicals and one specific site at a time to establish safe levels; LCA deals with hundreds to thousands of chemicals from multiple sources to determine best-in-class solutions. In order to cope with the high number of chemicals, their potential interactions with biological organisms and with each other, new LCA impact assessment method developments are required to improve the meaningfulness of the assessment of chemical emissions taking into account different mode of actions, different routes of exposure, different end points (endocrine disruptors, etc.), tailored toward meeting the different scopes, spatiotemporal resolutions and data constraint in HERA and LCA. Submissions proposing new approaches of addressing, in LCA context, the complexity of chemical interactions with the natural environment and human are welcome.