A guidance document for nitrogen impact assessment for human health and environment qualities

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Abstract

The nitrogen cascade has multiple impacts on humans and nature. Globally, excess reactive nitrogen (Nr) to the environment has been recognized as one of the urgent global environment exceedances of the current safe-operating capacity of our planet (i.e., the Planetary Boundary). As a part of the Towards an International Nitrogen Management System (INMS) project, we developed a Guidance Document of Nr impact assessment methodology for human health and environment qualities. This Guidance Document describes the methods by which to assess negative and positive impacts of Nr at different spatial scales. The complex impacts of Nr take place across multiple sectors, contexts and scales, so we developed a comprehensive matrix of both positive and negative impacts linked to WAGES (Water quality, Air quality, Greenhouse gases, Ecosystem & biodiversity, and Soil quality), and food, energy and societal values. The matrix includes 37 key indicators and their links to available global models on nitrogen flow, impact analysis and economic valuation. This is a first global comprehensive Nr impacts matrix and will be a useful foundation for interpreting model outputs and policy implications of Nr management. The target audience of this Guidance Document includes scientists and policymakers who apply the e nitrogen impact assessment methods. We apply the DPSIR (Drivers, Pressures, States, Indicators and Responses) framework to identify key indicators and their relation to impacts for human health and environment qualities. The Guidance Document will describe integrated and specific assessment methodologies of multiple Nr impacts using current scientific knowledge regionally and globally.

Keywords: Global assessment, DPSIR framework, WAGES clusters, INMS Activity 1.2