Evaluation of soil ecosystem health and services according to sustainability thresholds for industry impacts

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Abstract:
An existing framework for evaluating soil ecosystem health and services ([1]Thomsen et al., 2011) is tested by use of ERICA for quantifying indicators susceptible to chemical stressors. ERICA (Environmental Health Index for a Chemical Assessment) ([2]Boriani et al. 2010) provides clear information to regulators and population about the possible hazards in a site and the relative effects on the ecosystem and human health status.
ERICA presents a strong scientific derived chemical index covering main environmental compartments, which makes it possible to evaluate sink-source patterns in the outer environment.
ERICA may not only evaluate soil ecosystem health, but also the indirect industry impact on human health within the built area land use scenarios.
New indicators for cumulative impacts of identified risk cluster are tested in synergy with an improved index for quantifying bioavailability.
The presentation put focus on the improvement of ERICA instrument to measure the indirect industry impact on human health proposing an integrated risk assessment approach to measure the impact of the policy and procedures adopted by the companies to quantify suitability of land use, i.e. soil ecosystem health and services. A dedicated instrument for the industry to measure their emissions impact on ecosystem and human health and, i.e., the need for soil ecosystem health management by means of soil health improving intervention strategies is presented.
Regarding soil ecosystem health, inputs from the planned EU soil directive ([3]EU Directive 2006), will be taken into account in the entire framework as a regulatory strategy to be followed and the cut off thresholds will be analyzed within the new indicators
Regarding human health aspects within built up areas, ERICA allows focusing the critical routes of human exposure according to the ecosystem services provided considering suitability for land use with respect to vulnerable population groups.

[1] Thomsen M., Faber J., Borgen Sorensen P. Soil ecosystem health and services - Evaluation of ecological indicators susceptible to chemical stressors. In press – Ecological Indicator

[2] Boriani E., Mariani A., Baderna D., Moretti C., Lodi M., Benfenati E. ERICA: a multiparametric toxicological risk index for the assessment of environmental healthiness. Environment International 2010 36 : 665-674

[3] Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC/* COM/2006/0232 final - COD 2006/0086 */