A framework for setting soil health targets and thresholds in agricultural soils

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Soil health is a key concept in worldwide efforts to reverse soil degradation, but to be used as a tool to improve soils, it must be definable at a policy level and quantifiable in some way. Soil indicators can be used to define soil health and quantify the degree to which soils fulfil expected functions. Indicators are assessed using target and/or threshold values, which define achievable levels of the indicators or associated soil functions. However, defining robust targets and thresholds is not a trivial task, as they should account for differences in soil type, climate, land-use, management, and history, among other factors.

We assessed (through theory and stakeholder feedback) four approaches to setting targets and thresholds: fixed values based on research, fixed proportions of natural reference values, values based on the existing range (e.g. lower quartile of the observed distribution), and targets based on relative change (e.g. a 20% increase of the indicator's value). Three approaches (not including relative change) were then further explored using case study examples from Denmark, Italy, and France, which highlighted key strengths and weaknesses of each approach. Here, we present a selection of the assessment and case study results, as well as a framework, which facilitates both choosing the most appropriate target/threshold method for a given context, and using targets/thresholds to trigger follow-up actions to promote soil health.