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Does scale matter? Cost-effectiveness of agricultural nutrient abatement when target level varies

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Abstract

Agriculture is facing stringent requirements for nutrient loss reductions. These reductions should be done cost-effectively. For instance, the European Water Framework Directive (WFD) emphasizes cost-effectiveness in reaching good water status in European river basins by 2015. River Basin Management Plans specify the eventual reduction targets, which will differ between the basins. These differences have implications on cost-effectiveness assessments: changing the level of total abatement changes the relative shares of measures in the cost-effective allocation. In this paper we develop a model which determines the cost-effective allocation of three alternative measures to reduce phosphorus loss from fields. The model allows for comparisons with cost and reductions of all possible allocations. We show that, even for homogenous regions, the cost-effective allocation of measures is strongly dependent on the target level, and that using the allocation from one reduction level as a guideline for other levels violates cost-effectiveness seriously. On the grounds of these results we give recommendations for cost-effectiveness assessments in the context of the WFD.

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