

# Conceptual design of decision support tools for targeted N-regulation – Experiences from Denmark

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## **Extended abstract (preliminary)**

Until recently regulation of nutrient discharges from agriculture in large parts of the OECD was dominated by a system of reporting schemes and associated general rules for nutrient application. These mainly top-down oriented approaches generally do not take local scale variation in agroecological conditions for into account, making it difficult to fit general aims and demands by the public with local scale decision making patterns in the agricultural sector. In Denmark current policy debates on nitrogen emission from agriculture have focused on improving the cross-scalar fit and efficiency of regulatory schemes by introducing spatially targeted regulation measures based on stakeholder involvement at local scales. Such measures are likely to be based on politically agreed emission targets at watershed scales and will depend on socio-politically agile tools to model actual and desired N-fluxes at local scales becoming available. The purpose of the work reported here has been to further develop and test a prototype tool (the dNmark landscape model) able to model N-emissions at local scales based on land use information made available in situ in scenario-situations controlled by local land use managers and their consultants. Drawing on recent work in the fields of collaborative planning and environmental modelling we here outline and evaluate the conceptual basis for our design. We conclude that the design of decision support tools intended for use locally can be conceptualized as a form of “dialogue-management”, where the main aim is to provide a communicational bridge or meeting point between locally based experiential land use expertise held by stakeholders and the more general, abstract type of modelled knowledge of typical effects of land use held by scientific experts. Based on preliminary tests It is concluded that three factors may be of particular importance when designing decision support tools of this kind: (1) Careful selection of the variables made available for editing (2) Clear and efficient workflow designs, making modelled estimates available rapidly to participants in scenario-workshops where experiential and modelled land use realities meet; (3) Clear communication of the epistemological status of the expertise being introduced into local communities through the application of general scale modelling techniques.