



## DNMARK: Danish Nitrogen Mitigation Assessment: Research and Know-how for a sustainable, low-Nitrogen food production

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### ABSTRACT

The aim of this paper is to present the Danish Nitrogen Mitigation Assessment (DNMARK), a recently initiated 5-year multidisciplinary research alliance, focusing on the quantification of N flows and solutions scenarios for a more sustainable N use in Denmark. As one of the world's most agriculture intensive countries, with a long N regulation history, and state of the art monitoring of developments in key indicators for nitrogen losses, -use and -efficiency, Denmark is a case of special interest. Based on the results and recommendations from the European Nitrogen Assessment (<http://www.nine-esf.org/ENA>), DNMARK focus on all parts of the N cascade, and demonstrates results both at the landscape scale, and the national scale. Results from the national N-flow and N-balance accounting 1990-2010 are presented, and methods for the downscaling of these results to regional pilot study regions are discussed, together with approaches for the integrated assessment and modeling of the three main types of solution scenarios defined: i) New production chains with a more efficient use and recycling of N, ii) Geographically differentiated N-measures implemented by cost-effective instruments with localized planning and management of agricultural landscapes, and iii) Changed consumption patterns driving land use change and reducing N use.