

EEA Core Set of Indicators - CSI 025

Gross nutrient balance

May 2005 assessment

working draft

About this document

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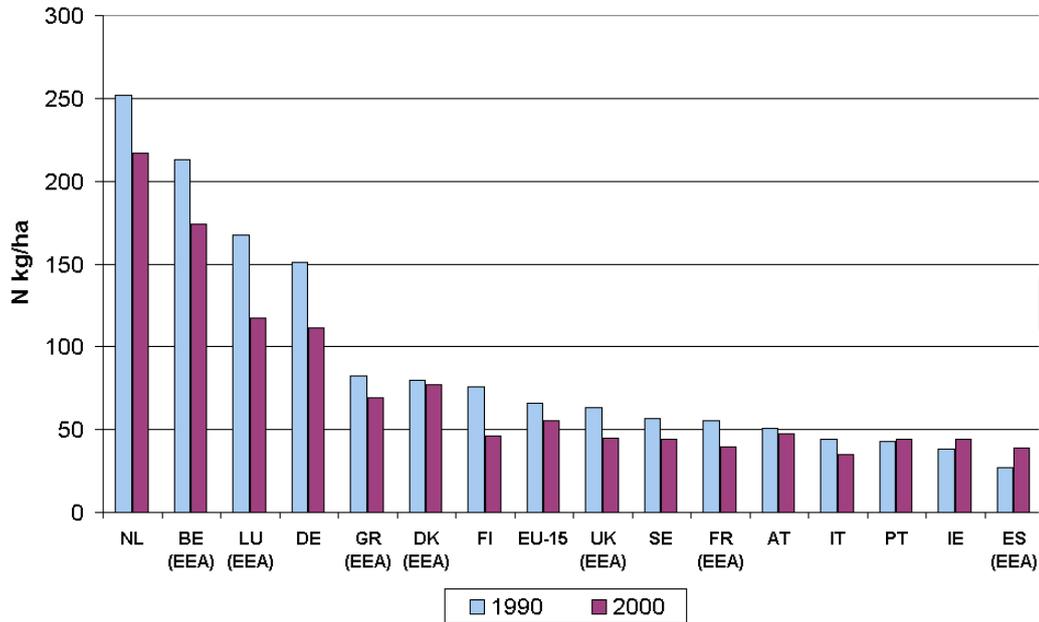


Key policy question: Is the environmental impact of agriculture improving?

Key message: At EU-15 level the gross nitrogen balance in 2000 was calculated to be 55 kg/ha, which is 16% lower than the balance estimate in 1990, which was 66 kg/ha. In 2000 the gross nitrogen balance ranged from 37 kg/ha (Italy) to 226 kg/ha (the Netherlands). All national gross nitrogen balances show a decline in estimates of the gross nitrogen balance (kg/ha) between 1990 and 2000, apart from Ireland (22% increase) and Spain (47% increase). The following Member States showed organic fertiliser application rates greater than the threshold of 170 kg/ha specified by the Nitrates Directive in 2000: the Netherlands (206 kg/ha) and Belgium (204 kg/ha). The general decline in nitrogen balance surpluses is due to a small decrease in nitrogen input rates (-1.0%) and a significant increase in nitrogen output rates (10%).

- The gross nutrient balance for nitrogen provides an indication of potential water pollution and identifies those agricultural areas and systems with very high nitrogen loadings. As the indicator integrates the most important agricultural parameters with regard to potential nitrogen surplus it is currently the best available approximation of agricultural pressures on water quality. High nutrient balances exert pressures on the environment in terms of an increased risk of leaching of nitrates to groundwater. The application of mineral and organic fertilisers can also lead to emissions to the atmosphere in the form of nitrous dioxide and ammonia, respectively.
- Gross nitrogen balances are above 100 kg N per ha and year in the Netherlands, Belgium, Luxembourg and Germany. They are particularly low in most Mediterranean countries given the overall lower livestock production in this part of Europe. It is currently not possible to provide gross nitrogen balance estimates for the new EU Member States and the accession as the relevant statistical data are under elaboration.
- National balances, however, can mask important regional differences in the gross nutrient balance that determine actual nitrogen leaching risk at regional or local level. Individual Member States can thus have overall acceptable gross nitrogen balances at national level but still experience significant nitrogen leaching in certain regions, for example in areas with high livestock concentrations. There are a number of regions where pig livestock units have increased by more than 25% between 1990 and 2000 (for example, north-western Denmark, north-western France, north-eastern Spain and north Belgium). These are likely to be regional 'hotspots' for high gross nitrogen balances that can lead to environmental pressures. Member States with high nitrogen balances are making efforts to reduce these pressures on the environment. These build on a range of different policy instruments, requiring considerable political effort to succeed given the significant social and economic consequences of reducing livestock production in many affected areas (van Grinsveen et al., 2004 and Mikkelsen et. al., 2004).

Fig. 1: Gross nutrient balance at national level



Data source: OECD website (<http://webdomino1.oecd.org/comnet/agr/aeiquest.nsf>) and EEA calculations

Note: EEA calculations on the basis of the following: Harvested crops and forage Crop area (Eurostat's ZPA1 data set or Farm Structure Survey); Livestock numbers (Eurostat's ZPA1 data set or Farm Structure Survey); Livestock excretion rates (OECD or averaged coefficients from Member States); Fertiliser rates (EFMA); Nitrogen fixation (OECD or averaged coefficients from Member States Farm Structure Survey); Atmospheric Deposition (EMEP); Yields (Eurostat's ZPA1 data set or average coefficients from Member States).