January 2010

The EU Nitrates Directive

EN

WATER

The background to the Directive

Pure, clean water is vital to human health and well-being, as well as to natural ecosystems, so safeguarding water quality is one of the cornerstones of European environmental policy. Because water sources are not restricted within national boundaries, an EU-wide approach is crucial to tackling problems of pollution. The 1991 Nitrates Directive is one of the earliest pieces of EU legislation aimed at controlling pollution and improving water quality.

While nitrogen is a vital nutrient that helps plants and crops to grow, high concentrations are harmful to people and nature. The agricultural use of nitrates in organic and chemical fertilisers has been a major source of water pollution in Europe. For the first time mineral fertiliser consumption registered a progressive reduction in the early 1990s and stabilised during the last four years in the EU-15, but across all 27 Member States nitrogen consumption has increased by 6%. Generally, farming remains responsible for over 50% of the total nitrogen discharge into surface waters.

The **Nitrates Directive** (1991) aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices.

It is proving effective: Between 2004 and 2007, nitrate concentrations in surface water remained stable or fell at 70% of monitored sites. Quality at 66% of groundwater monitoring points is stable or improving.

All Member States have drawn up action programmes: there are more than 300 of them across the whole EU. The quality of programmes is improving.

Across the 27 EU Member States, 39.6% of territory is subject to the implementation of action programmes.

Farmers are becoming increasingly positive about environmental protection, exploring new techniques such as manure processing.

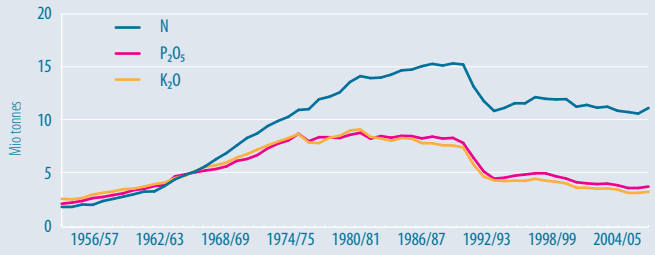
Agriculture remains a major source of water-related problems, and farmers need to continue to adopt more sustainable practices. Huge efforts are still needed in order to restore water to optimal quality across the EU.

water

EUROPEAN COMMISSION

environment

Fertilizer nutrient consumption in the European Union 27



Source: EFMA, 2009

Keeping a check on water

Fact 1: An expanding monitoring network is demonstrating a trend towards steady or falling nitrate concentrations

Under the Directive, all Member States have to analyse their waters' nitrate concentration levels and trophic state. Good monitoring is crucial, and means setting up high-quality monitoring networks for ground, surface and marine waters. There are currently 31 000 groundwater sampling sites in the EU, and 27 000 surface water stations. Belgium, Malta and Denmark have the densest monitoring networks.

Every four years, the European Commission compiles a report on implementation of the Directive, based on information from national authorities. In 2008-2009, for the first time, all 27 Member States made formal submissions.

The Commission's report for the period 2004-2007 reveals that 15% of **groundwater** monitoring stations in the EU-27 found nitrate levels above the limit of 50mg of nitrates per litre. On the other hand, 66% reported levels below 25 mg/l. As most of the EU-12 reported for the first time, trends in concentrations were only assessed for the EU-15, where two-thirds of monitoring stations reported steady or falling levels of nitrates, and for Bulgaria, Cyprus, Estonia and Hungary, where 91% of monitoring sites found steady or decreasing levels. The map shows nitrates average concentrations in groundwater.

The deeper the groundwater is, the cleaner it tends to be. The highest proportion of contaminated water lies between five and 15m below the surface.

According to data on **fresh surface water**, 21% of monitoring stations in the EU-27 found nitrate concentrations below 2 mg/l, and only 3% reported more than 50 mg/l. At EU-15 level, 70% of sites reported stable or falling levels of nitrates compared to the period 2000-2003. Austria, Germany, Greece, Finland, Ireland, Luxembourg, Portugal and Sweden detected no surface waters with nitrate levels above 50mg/l.

The diverse criteria used to assess trophic state mean it is difficult to compare different Member States. However, countering eutrophication in lakes and marine waters remains an important challenge in large parts of Europe.

Work in progress

Fact 2: The Directive sets out a clear strategy for implementation, which involves farmers

Member States have designated territories draining into waters that are or could be affected by high nitrate levels or eutrophication as vulnerable zones. Austria, Denmark, Finland, Germany, Ireland, Lithuania, Luxembourg, Malta, the Netherlands and Slovenia decided to provide the same level of protection to their whole territory, rather than designate nitrate-vulnerable zones.

Member States had to establish codes of good practice for farmers, to be implemented on a voluntary basis throughout their territory, and develop specific action programmes for compulsory implementation by farmers located in nitrate-vulnerable zones.

Periodically, they have to revise their designation of vulnerable zones, to monitor the effectiveness of action programmes and amend them to ensure they match up to the Directive's objectives, and submit their findings to the European Commission.

Learning from doing

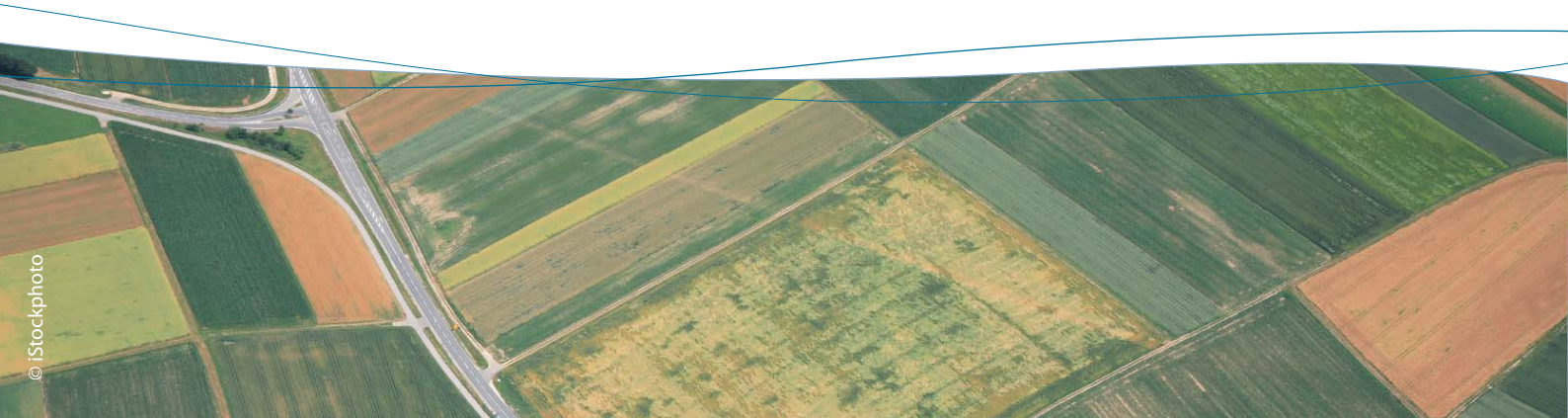
Fact 3: All 27 Member States have drawn up action programmes to cut nitrate pollution, and their quality is improving

Action programmes have to include a set of measures laid down in the Directive, relating to, for example, periods when fertilisation is prohibited, minimum storage capacity for livestock manure, and rules to control the spread of nutrients near water or on slopes, to reduce the risk of contamination.

All Member States have drawn up one or more action programmes.

Most action programmes cover all the vital measures, and all of them include the limit of 170kg nitrogen per hectare per year from livestock manure that is set out in the Directive. But some programmes need to set tougher rules on storage provisions, balanced fertilisation and periods when fertilisers are banned.

- Storage capacity has increased since the last reporting period, but is still a frequent problem. It has to cater for the periods when applying manure is banned, or impossible due to weather conditions. The main obstacle for farmers is the lack of financial resources, so some extra investment may be needed.



- Most farmers comply readily with the rules. Where problems exist, they centre on inaccurate record-keeping and lack of knowledge, especially among smallholders. However, several countries report growing support for environmental protection among farmers.
- Cyprus, Hungary and Spain couple fertiliser application rules with regulation of irrigation systems. For example, 85-90% of Cypriot farmers apply advanced irrigation techniques adapted to actual crop needs.

The Directive allows Member States to get derogations to go beyond the 170kg limit, under strict conditions. They have to demonstrate that they can meet the Directive's objectives by improving other measures and reducing nutrient losses in other ways. They must offer objective justifications for using higher quantities of manure than correspond to 170kg nitrogen per hectare per year, which are allowed under the Directive: for example, long growing seasons, crops with high nitrogen uptake, high net precipitation or exceptional soil conditions. The derogation is granted through a Commission decision, following a positive opinion from the Nitrates Committee.

Seven countries obtained derogations up to December 2009: Austria (expired at the end of 2007), Belgium (two Commission decisions, for Flanders and Wallonia), Ireland, Germany, Denmark, the Netherlands and the United Kingdom (two Commission decisions for England, Scotland and Wales, and Northern Ireland).

Putting it in context

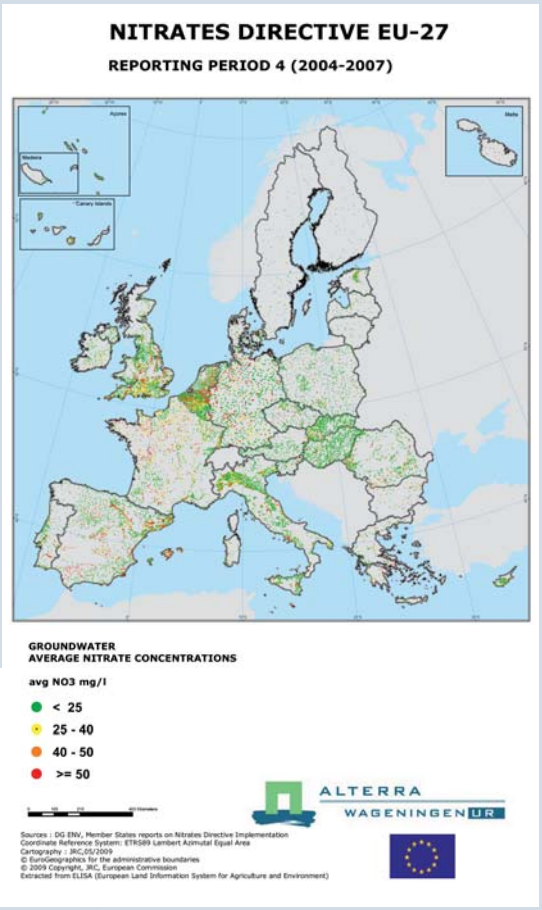
Fact 4: The Nitrates Directive forms part of a comprehensive framework of EU legislation to protect the environment

The Nitrates Directive has close links with other EU policies concerning water, air, climate change and agriculture, and its implementation yields benefits in all these areas:

- Reducing nitrates is an integral part of the **Water Framework Directive** (2000), which establishes a comprehensive, cross-border approach to water protection organised around river basin districts (RBDs), with the aim of achieving good status for European bodies of water by 2015.
- The new **Groundwater Directive** (2006) confirms that nitrate concentrations must not exceed the trigger value of 50mg/l. Several Member States have set their own tighter limits, in order to reach good status.
- **Air and soil quality:** livestock management and farming cause, among other things, emissions of ammonia (NH_3), which have an impact on human health and on the environment, as they contribute to the acidification process in soil, eutrophication of waters and ground-level ozone pollution, together with other pollutants (sulphur dioxide, nitrogen oxides, volatile organic compounds). The full implementation of the Nitrates Directive is expected to contribute to the reduction of ammonia emissions by 14% on 2000 levels by 2020, as measures limiting, for example, amounts of fertiliser applied, have a positive impact on both nitrate losses towards waters and ammonia emissions into the air.
- **Climate change:** All activities related to livestock and fertiliser management release nitrous oxide (N_2O) and methane (CH_4), greenhouse gasses with a global warming potential 310 and 21 times higher than CO_2 respectively. If fully implemented, the Nitrates Directive could cut N_2O emissions by 6% on 2000 levels by 2020, for example, and contribute to climate change mitigation.
- The **common agricultural policy** (CAP) backs up the Nitrates Directive through direct support and rural development measures. For example, several Member States have included nutrient management measures,

Trophic state

When high quantities of nutrients from sewage or fertilisers contaminate water bodies, they can cause eutrophication. This describes the excessive growth of weeds and algae that choke and discolour the waters, disrupting normal ecosystems and depriving fish of oxygen. Around 33% of monitoring stations in European rivers and lakes show signs of eutrophication, as well as some coastal waters.



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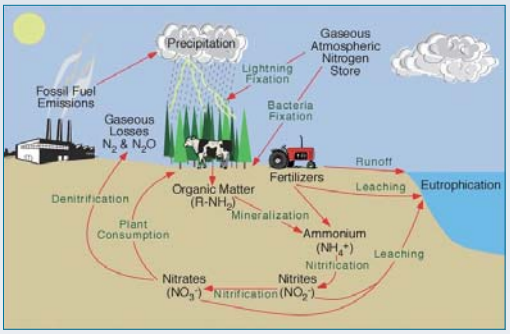
The nitrogen cycle

Nitrogen is crucial to life on earth, and the **nitrogen cycle** is one of the most important nutrient cycles for natural ecosystems. Plants absorb nitrogen from the soil, and animals eat the plants. When they die and decompose, the nitrogen returns to the soil, where bacteria convert it and the cycle starts again. However, farming activities can disturb the equilibrium of this cycle, for example through excessive application of fertilisers, causing on the one hand water pollution and eutrophication, due to an excess nutrient load, and on the other acidification and greenhouse gas effects, due to gaseous emissions.



such as wider buffer strips around water courses, among the agri-environmental initiatives for which farmers can receive payments. Direct support is subject to cross-compliance with EU environmental legislation, including the Nitrates Directive.

- The **Urban Wastewater Directive** (1991) sets standards for the collection and treatment of wastewater from homes and some industrial sectors.

Innovation

Fact 5: New technologies such as manure processing are growing in popularity and offer new ways to deal with pollution

The reports reveal a growing interest in manure processing initiatives. In livestock-intensive areas with high nutrient surpluses, farmers are processing their slurry for easier transport and management. Techniques range from simple separation into solids and liquid, to drying, composting or incineration of solid fractions, and membrane filtration or biological treatment to allow the cleaned liquid fraction to go back into water systems. This is often combined with digestion processes in biogas installations for energy production. Groups of farmers have invested in cooperative installations, notably in Belgium, the Netherlands and Spain.

Livestock farmers are also experimenting with new feeding techniques such as low N diets and advanced feeding management, which improve feed conversion efficiency and reduce nutrient excretion.

The outlook is positive

Fact 6: Overall, the 2004-2007 report indicates good progress towards cleaner water

In the EU, water quality is getting better and action programmes are improving in quality and effectiveness. The area of EU territory subject to the implementation of action programmes has grown, especially in the EU-15, where it has gone up to 44.6% of the total area. Since 2004, Belgium, Italy, Portugal and Spain in particular have increased their vulnerable zone size. However, in several regions the area still needs to be expanded.

Overall, 70% of surface waters are moving in the right direction, together with 66% of groundwater. Cuts in livestock numbers and fertiliser use are helping, but agriculture is still a big source of nitrogen in surface waters.

Many Member States need to step up their efforts regarding monitoring, identifying pollution hotspots, and tougher action programmes. The Commission will continue to work with Member States, supporting them in order to achieve the Directive's objectives.

Further information

Implementation of Nitrates Directive:
http://ec.europa.eu/environment/water/water-nitrates/index_en.html

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