



FRAMEWORK DIRECTIVE FOR WATER

Bottom of the class for water quality



The Netherlands has the worst water quality of all EU member states: only one per cent of our waters are assessed as 'good'. So we are unlikely to fulfil the European Water Framework Directive in time. 'In this watery country, we're going to have to get firmer with farmers, the general public and industry alike.'

TEXT RENÉ DIDDE PHOTO BLIK ONDER WATER / MATTHIJS DE VOS

**PIET GROENENDIJK**

Researcher into agriculture and water quality at Wageningen Environmental Research

‘It’s especially important to cut the amount of nitrogen on sensitive land’

**PAUL VAN DEN BRINK**

Personal professor of Aquatic Ecology and Water Quality Management and senior researcher at Wageningen Environmental Research

‘What good are norms if they are widely exceeded?’

Five years. That’s how much time the Netherlands has left to do something about the exceedingly low marks it’s been getting in water quality reports for 15 years. For years, Dutch groundwater and surface water, such as rivers, canals, streams and lakes, have contained too many fertilizers like nitrate and phosphate, and residues of chemicals such as pesticides. It’s not looking too good on other fronts either, what with the large quantities of PFAS and microplastics in Dutch waters. And the production and use of medicines and cosmetics leads to a lot of toxic micropollutants being dumped in the water.

In five years, in 2027, all European member states are expected to comply with the European Water Framework Directive (WFD). The WFD came into force across Europe in 2000, partly at the instigation of the Netherlands. The aim was for all European waters to achieve ‘good status’ for both their ecological and their chemical quality.

STAGNATION

Water pollution was substantially reduced in the Netherlands from the 1980s onwards through more and better water treatment plants and a pro-active policy on manure. The industrial discharging of heavy metals and PCBs decreased as well. But to attain that ‘good status’ the country was going to have to up its game. Ironically enough, stagnation set in not long after the introduction of the WFD. ‘In some places, we are even seeing a deterioration in the water quality,’ says Piet Groenendijk, a researcher at Wageningen Environmental Research who specializes in the relationship between agriculture and water quality. Emissions of nitrate and phosphate from agriculture began to increase again in some places, and many new industrial substances were found that had not previously been present in detectable quantities. ‘It took the Netherlands a very long time to set up

a system for the WFD and to expand its monitoring. We talk a lot about PFAS at the moment. We’ve only been able to measure this group of substances since a few years ago, but they’ve been dumped for much longer,’ says Groenendijk.

‘The Netherlands is already the cesspit of Western Europe, with polluted water flowing into the country via streams and rivers,’ says Peter Schipper. He works on models for water quality, nutrient leaching and crop protection agents at Wageningen Environmental Research. ‘And of course we add to the pollution with our agriculture, industry, traffic and high population density. Pollution has intensified in a period in which no one was bothering with spatial planning anymore. Anything was allowed anywhere – that’s why we are now running up against the limits of the water and soil system.’

The Water Framework Directive is a complex European directive whose key aim is for all water bodies in the member states to achieve ‘good ecological and chemical status’. There are more than 700 designated ‘water bodies’ in the Netherlands, from a stream of two kilometres long to a river of 200 kilometres. Their ecological status is assessed based on the quality of aquatic life, from tiny organisms to fish such as salmon. Their status is determined based on the concentrations of 40 ‘priority substances’, such as benzene and pesticides like diuron and dichlorvos, and a series of further categories including nutrients like nitrate and phosphate.

The test score consists of a complicated aggregation of all these categories. The insidious thing about it is that if a water body fails on one criterion (a chemical, nitrate or whether water fleas are thriving), the whole water body fails to make the grade. This ‘one out, all out’ principle means that in the Netherlands only 1 per cent of the water scores ‘good’ in all categories, therefore complying with the



Part of the failure to meet the European Water Framework Directive targets is due to agriculture, mainly through the leaching of fertilizers and pesticides.

WFD. Sadly then, the Netherlands comes last out of the 27 member states, according to the latest available data from 2019. In Finland, 78 per cent of the water has ‘good status’. It is mainly the ecological status that falls short in Dutch waters, and is found to be middling or unsatisfactory. Only 17 per cent of the water scores well ecologically; 83 per cent of waters require urgent action.

INTERIM TARGETS

In 2009 and in 2015, the Netherlands requested and was granted an extension on the deadline for achieving interim targets, both for water quality and for adaptations such as fish ladders and restoring meanders in straightened streams. And that while many of the waters in the Netherlands are constructed canals and waterways which do not have to meet such strict requirements as streams and rivers do. So effectively, the quality of about 300,000 kilometres of constructed ditches doesn’t get assessed at all. As a result of all this, specialists from nature conservation organizations

Natuurmonumenten and the World Wildlife Fund, as well as the Netherlands Environmental Assessment Agency (PBL), do not think Dutch water quality will make the grade in 2027.

In which case, the country faces fines of tens of millions of euros a year from Brussels. Some legal experts foresee a crisis along the same lines as the current impasse about nitrogen. Brussels has imposed fines in similar cases in the past, PBL researcher Frank van Gaalen said in the VPRO radio programme *Argos*. Back in 2005, for instance, France was fined 20 million for not complying with European fish directives.

‘We need to renew our efforts to reduce the manure surplus’

The WFD is the only way to force water managers to take action, says Paul van den Brink, personal professor of Aquatic Ecology and Water Quality Management and senior researcher at Wageningen Environmental Research. One of the topics he researches is the effects of chemical stress on aquatic organisms. Another is how the aquatic system is affected by the interaction between chemicals and climate change. ‘As a result of our research, the standards for application of a number of pesticides have been tightened up, so the WFD targets can now be met for these chemicals. For instance, our research >



PHOTO ANP / DOLPH CANTIRIN

Wastewater at the sewage treatment plant in Tilburg is being tested for levels of phosphate, nitrate, ammonium and dry matter.

on the effects of the insecticide imidacloprid on aquatic insects such as mayflies has led to a substantial reduction of the standards.’ ‘But what good is that if the standards are widely exceeded?’, Van den Brink wonders. In his view, there is a failure to enforce the rules. ‘In this watery country, we will have to get firmer with farmers, the general public and industry alike, and monitor industrial discharges more and withdraw licences where necessary. For instance, we should check whether farmers abide by no-spray zones along ditches,’ says Van den Brink. Because the pollution in ditches – not targeted in the WFD and therefore not sampled – runs into the relatively clean water of major rivers like the Rhine. This river water gets circulated through much of the Netherlands. For example, water from the IJsselmeer lake – which originates from the Rhine – passes through the lock at Lemmer into Friesland and Groningen, eventually reaching Drenthe with all its pollution. Roel Knoben, a WUR Environmental Hygiene alumnus, is pleased that the Public Works Directorate Rijkswaterstaat intends

to re-evaluate the discharge licences of 70 large industrial companies this year. Knoben is now a water quality and monitoring specialist at Royal HaskoningDHV, one of the main consultancies working on the WFD. He too expects the Netherlands to fail to meet the WFD targets. He thinks a lot of licences may have expired, and ‘extremely worrying substances’ that are carcinogenic or environmentally damaging are being discharged under a general category in the licence. Knoben: ‘Or we don’t use the best techniques available for preventing the discharge of pollutants. For many substances that get into the water, we don’t have a sufficiently sensitive measurement method to test compliance with standards. And yet they are still toxic, whether on their own or in combination with other substances.’ Such substances can affect WFD scores, however, especially for ecological status. ‘Possibly the toxicological effects of these types of substances need to be studied more thoroughly when assessing them for approval,’ Knoben says. He estimates that about a third of the failure

to meet WFD targets is due to agriculture, mainly through the leaching of fertilizers and pesticides. About a third of the failure is down to substances in domestic wastewater and industrial sources that are not captured by sewage treatment plants. These include phosphate, ammonium, drug residues and cosmetics. The rest comes into surface water from other sources, from neighbouring countries or through precipitation and flooding from sewers and sewage treatment plants during heavy showers. ‘At least 60 of the more than 300 sewage treatment plants are not up to scratch,’ Knoben said. ‘In some cases because they don’t yet have installations to capture phosphate from faeces, so it ends up in surface water.’ Knoben also points to notorious culprits such as polycyclic aromatic hydrocarbons (PAHs), which are released from incineration processes. ‘To some extent, these kinds of pollutants have been present in Dutch waterways for a very long time due to pollution in the past,’ Knoben says. ‘It’s often impossible to trace what is added by traffic and industry back to a particular

‘One in five sewage treatment plants does not meet standards’

source. So the law-enforcing party can't do anything about it, even though it counts for the WFD.' Something comparable applies to ammonium and metals such as arsenic, selenium, barium and cobalt, which are naturally present in the subsoil of Flevoland, for example. 'There is quite simply not much you can do about that kind of pollution,' Knoben said. He therefore expects that Brussels will treat the Netherlands with leniency on these points in 2027.

GLIMMERS OF HOPE

Groenendijk and Schipper do see some glimmers of hope, though. 'Steps have already been taken to improve things, and the results of that are not yet clearly visible. Half of the water bodies now meet the nitrogen and phosphate targets, but they don't count for much in in the WFD system because the water still fails the grade on other factors,' says Groenendijk. 'And we will only see the effects of restoring meanders in a stream in a few years' time – ecological improvements for instance.' Nevertheless, Groenendijk points out the need to reduce the leaching of fertilizers such as nitrate and phosphate into the water. 'We need to renew our efforts to reduce the manure surplus. For example, in large areas of eastern North Brabant and North Limburg, 20 to 30 per cent more manure has been spread than is permitted, according to calculations in several studies. In particular, nitrogen applications should be reduced on fields vulnerable to nitrate leaching,' says Groenendijk. In the case of phosphate, he thinks the situation is more complex. 'In many places, the soil is still "loaded" with such vast amounts of phosphate from past fertilization - the "phosphate bomb" - that the little bit you add doesn't make much difference. You need to take purification measures at the field edges, such as liming or adding iron-rich sludge in combination

with crops that absorb phosphate. You could also protect watercourses to prevent phosphate from getting through to the larger waterways.'

Groenendijk also points to possible spatial planning measures. He thinks the government should take the lead in banning the cultivation of crops that require a lot of manure and pesticides, such as potatoes and maize, on the leaching-prone sandy soils in Brabant and Limburg. Schipper adds: 'In sodden areas, water boards should stop draining the soils in order to keep all forms of agriculture going. That is not only bad for the quantity of water available, but also for quality. Drainage causes higher discharge rates of substances into the ditch. You would be better off designating the wettest land as nature areas.'

NEW LAND DEVELOPMENT

Groenendijk and Schipper expect a lot from the new National Rural Area Programme, the idea of which is to use an 'area-specific approach' to settle the many problems and the conflicting claims of agriculture and nature in the rural area. Schipper: 'Awareness of water issues isn't great in the Netherlands. On a positive note, though, water quality is clearly higher on the political agenda now. This is not only because the WFD deadline is approaching, but also because of growing concern about nature and biodiversity, the quality of drinking water sources and the visible effects of extreme drought on water quality. In the countryside, the WFD targets, nitrogen targets, nature development, water storage and drought management can potentially go hand in hand. Then there is some chance of success if spatial planning of land use and management is reinforced and financed.' ■

www.wur.eu/waterquality



PHOTO GUY ACKERMANS

PETER SCHIPPER

Researcher into nutrient leaching and crop protection at Wageningen Environmental Research

‘Awareness of water issues isn't great in the Netherlands’



ROEL KNOBEN

Water quality and monitoring specialist at Royal HaskoningDHV

‘We don't always use the best techniques available’