

Delta Dilemmas

Implementing the European Water Framework Directive in the Netherlands



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The Water Framework Directive (wfd) is extremely important to the Netherlands. There are few other European countries where international cooperation and policy harmonisation are so crucial to the achievement of good water quality as they are in the densely populated, water-logged Dutch Delta. For this reason, the Netherlands has always fully supported the objectives of the wfd.

At the same time, the wfd sets us an enormous task. Despite the vast improvements in water quality achieved over recent years, almost all bodies of water in the Netherlands appear to be at risk of failing to satisfy one or more of the quality standards set out in the wfd by 2015. Whether this will really be a substantial problem in all cases we are not yet sure, since the present assessment is based only on provisional data and estimates of future trends. But in any case we have decided to play safe. After all, if we underestimate the problems now, there will be no time to deal with them later.

At the moment we are conducting a public debate with relevant stakeholders on how best to achieve the wfd objectives in our water systems. The intrinsic and sometimes unique characteristics of the Netherlands – a low-lying, densely populated delta country, largely created by man – pose highly specific challenges. Some of these are technical in nature, others demand carefully considered choices with far-reaching consequences for the Dutch economy and way of life.

This brochure highlights some of the choices we have made in drafting the Article 5 river basin reports for the Netherlands. Some of these relate to problems which we share with neighbouring countries and which we can only effectively solve in cooperation with them. But some concern uniquely Dutch situations. What this brochure illustrates above all is the fact that implementation of the wfd is a question of tailoring solutions to specific problems. This will sometimes entail a quest for the right solution. But at least we know the precise goal of that quest: a clean and sustainable water system in the Netherlands, as elsewhere in the European Union, within the next ten years.



Melanie Schultz van Haegen

State Secretary for Transport, Public Works and Water Management.





View of the Barsemwaard (December 1998) showing the remains of the river branch that once linked the River Lek and the harbour at Culemborg. The cover photo shows the situation in December 2000. Digging out the accumulated clay deposits of the centuries has given the river more room (to flood its washlands more frequently) and permitted the development of a species-rich river bank and marshland vegetation.
Source: Panorama Nederland, Siebe Swart



Minor water bodies



“In making operational the programmes of measures specified in the river basin management plans for surface waters Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water” – WFD, Art. 4.

A crucial step in the implementation of the WFD is to identify water bodies. Once a water body has been identified, it must satisfy a number of chemical and ecological quality requirements. After all, the status of the river basin is determined by the quality of the various water bodies within it. And if that status is poor, it is at the level of the water body that something must be done to improve matters. This is why the WFD explicitly calls for measures to be taken in all water bodies that are “at risk”.

The challenge

But how many water bodies are there in the Netherlands? If you were to fly low over the Western Netherlands on a clear day, you would see literally hundreds of minor water courses below you. They are all part of a close-knit water system of a complexity rarely seen elsewhere in Europe. Over the whole country, the Netherlands has thousands of ditches and other tiny water courses. Many of them pass through areas of intensive agriculture. This means that they have a heavy impact on the ecological status of downstream areas. All the same, they are – as it were – ‘out of sight’ of the WFD because each of them is too small to count as a water body under the WFD definition (“a discrete and significant element of surface water”).

The dilemma

Should we just ignore minor water courses of this kind or is it worth planning separate measures and monitoring operations for each of them?

The solution

Disregarding minor water courses is obviously not an option. Not only do they have a heavy cumulative impact on the ecological status of the system as a whole, but each of them, however small, has to meet the full chemical quality requirements set out in the WFD. What's more, they are like the capillaries in the human circulatory system: almost negligibly small on their own, but together forming a considerable proportion of the overall system.

On the other hand, to determine the individual status of all these thousands of microsystems would take vast amounts of time and money, while we already know that the problem in most Dutch ditches is just about the same. All over the Netherlands, there is an excess of nutrients and pesticides in these small water systems, while the management of the systems is so strongly focused on the regulation of water levels that relatively little

300000km
300000km

The estimated total length of ditches in the Netherlands.



attention is paid to the development of ecological quality.

And if the problems are identical, so are the measures required to deal with them. In all these thousands of water courses, we need to combat eutrophication, reduce emissions of fertilisers and pesticides, and allow more scope for natural processes to occur wherever possible. A plethora of reports revealing only minor differences could easily confuse the issue, rather than promote incisive action to deal with it.

The 'capillaries' in the Dutch water system not only drain water from the land to the main arteries, they also deliver water to the land. In many of them, the direction of flow varies according to the season: in the winter, water is drained away; in the summer, it is delivered. Rhine water, including any pollutants it has collected upstream, flows into the IJsselmeer and is pumped from there deep into the Dutch water system to wherever it is needed. The arrows in this map indicate the direction of flow on one summer day in 2003; the figures represent the rate of flow (in m³ per second).

In other words, the question is how to find a practical, feasible way of policing the quality of thousands of microsystems. In the Article 5 analyses of Dutch river basins, the problem has been tackled by referring to 'virtual water bodies': groups of minor water courses of the same type, which may not be physically linked, but are exposed to more or less the same environmental pressures and can reasonably be expected to share the same ecological status. Thanks to this device, the reports give a clear picture of the status of the 'capillaries' of the Dutch water system and the work that needs to be done on them over the next ten years. But as we work towards the river basin management plans, other possible approaches are being examined. For example, there are similarities between the Dutch polder systems with their multitudes of ditches and



river basins containing many small streams. Perhaps the WFD method for river basins could be applied to the networks of ditches in the Netherlands. Whatever the outcome, this issue will certainly remain high on the agenda.

Ditches that drain into a ring canal are rather like the perennial and intermittent streams in river systems: they are often too small to be included in monitoring operations, but nevertheless make a substantial contribution to the receiving water body.

Far from natural



“Good surface water status means the status achieved by a surface water body when both its ecological status and its chemical status are at least ‘good’.”

- WFD, Art. 2, 18.

How good is good? In the case of chemical status, there are fixed uniform requirements that apply to each and every water body. When it comes to ecological quality, the answer is not so simple. The WFD yardstick for measuring good ecological quality is based on the highest quality that can occur in a water body in its undisturbed “natural” condition. This ideal situation is used to determine the ecological objectives that a body must meet in order to be labelled as possessing “good ecological status”. However, if the physical form of the water body has been “substantially changed” as a result of human activity, it will often be difficult (if not impossible) to achieve this standard. In that case, the goal is to achieve the “maximum ecological potential”. If a water body would simply not have existed without human activity (an “artificial water body”), the ecological objectives are based on the natural situation of the most similar type of natural water body.

The challenge

In the Netherlands, as in many other European countries, the water system has been strongly influenced by human activity. Over the last thousand years, the Netherlands has been literally wrested from its surrounding waters. In the higher parts of the country, innumerable barriers and modifications have been made to influence flow patterns and drain agricultural land. In the low-lying parts, the majority of the water bodies have actually been created by man as part of land reclamation schemes, while the remainder of the water system is strictly controlled in order to protect millions of people against flooding. The present shape and security of the Netherlands is due to a system of polders, river dikes and sea defences that is ancient enough to be regarded as part of the national and world heritage. So it is difficult to return water bodies to a natural condition; indeed, it is frequently impossible to find out whether there has ever been a stable natural situation, let alone what that may have been.

The dilemma

What ecological quality can be regarded as the maximum achievable in a water system that has been so fundamentally altered as that of the Netherlands?

The solution

The Netherlands has little choice other than to regard Dutch water bodies as, almost by definition, heavily modified. Having said that, there has been a revolution in thinking since the late eighties and the government is now seeking ways to give rivers and streams more room and to restore natural processes wherever possible. But there is virtually no water body in the Netherlands where all the hydromorphological changes of the past can be reversed without severe harm to the economy and society. Moreover, the combination of the constant threat of flooding, high population pressures and intensive land use calls for meticulous apportionment of the water entering the Netherlands. Not a drop escapes control.

So how far does this affect the implementation of the WFD? Less than may at first glance appear. Whether or not a water body is regarded as heavily modified, it still



of Dutch territory (including territorial waters) consists of wetlands – natural, heavily modified or artificial. All but one of them are protected, either under the Birds Directive or as part of the Natura 2000 ecological network.



The sluices built to seal off the Haringvliet from the sea are to be partially re-opened. This will restore a natural gradient from salt water to fresh. It will also enable fish like salmon and trout to migrate through the sluices. This is an important step in the ecological restoration of the Rhine/Maas estuary.

has to meet the same standards of chemical quality. The definitions both of good chemical status and of the chemical component of good ecological status are the same for natural and heavily modified water bodies. So the Netherlands must ‘simply’ do its utmost to satisfy those requirements. According to the WFD, the main difference between a natural and a heavily modified water body is its biological and hydromorphological quality. Put simply, the ecological objectives for heavily modified water bodies take account of the adverse effects of any man-made changes while the objectives for natural water bodies do not. So if the Netherlands wants to regard a water body as “natural”, it has two options: either to reverse the changes that have been made or to provide some form of compensa-

tion for those changes so as to create an ecologically “natural” situation despite the “unnatural” hydro-morphology. In the vast majority of cases, the first option is out of the question: without the present system of dikes and water regulation, approximately half the land area of the Netherlands would be permanently inundated. The second possibility is now being investigated wherever possible. Recently, for example, it has been decided to partially re-open the sluices built in the 1960s to seal off the Haringvliet estuary from the sea. This will restore fish migration, tidal action and – hopefully – the estuarine biota associated with it.

However, it must never be forgotten that water bodies may be heavily modified or even artificial and still

provide valuable opportunities for wildlife. Indeed, some wildlife habitats in heavily modified water bodies are actually the result of the modifications made in them. Without the empoldering of the IJsselmeer, the Oostvaardersplassen – a lake with typical freshwater biota – would never have existed

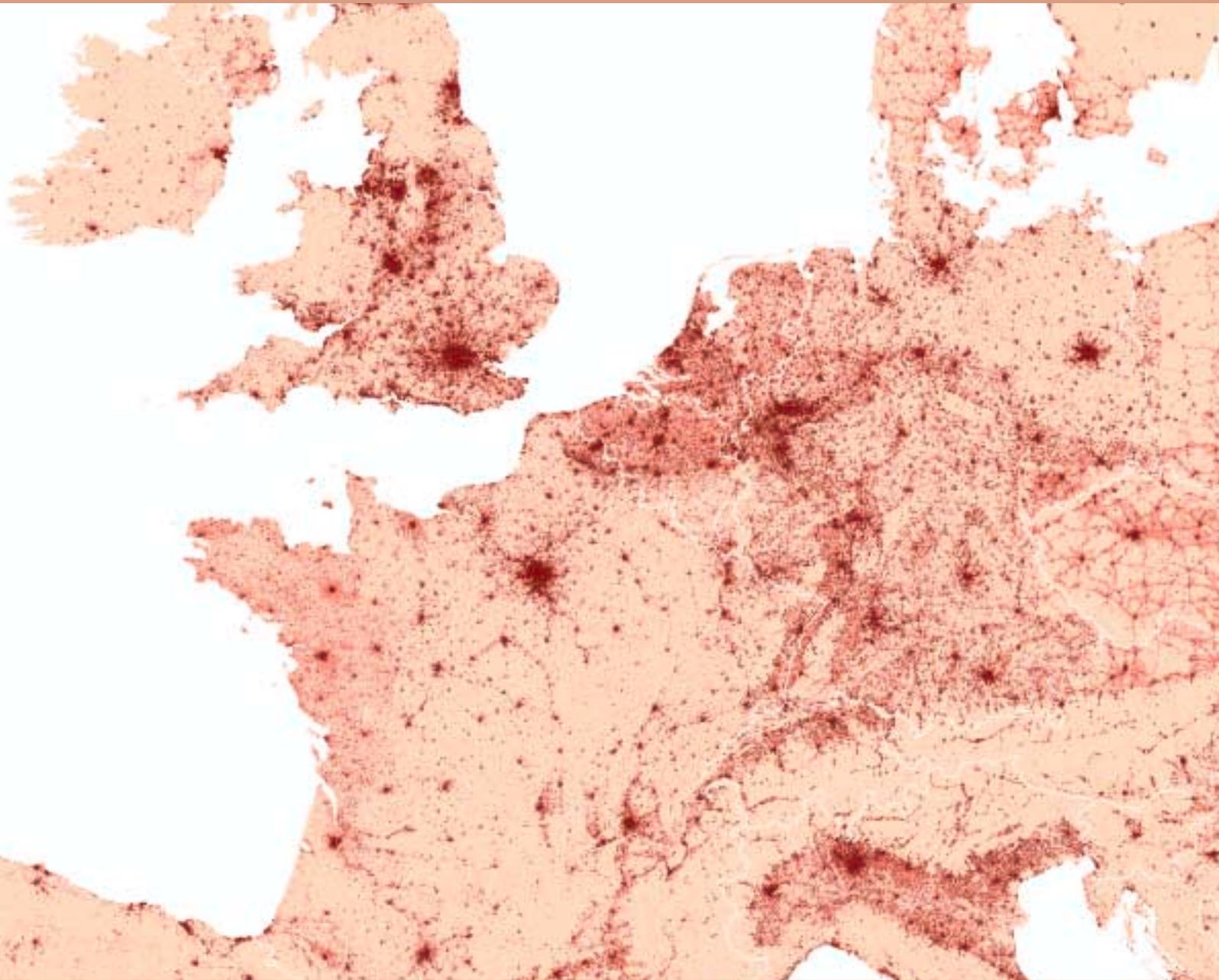
(see photo page 8). It may be entirely artificial, but it is still ecologically sufficiently outstanding to be designated under the Birds and Habitats Directives. Many other wetland wildlife areas in the Netherlands are likewise heavily modified, if not actually artificial, but nevertheless of such ecological value that all fur-

ther development should be prevented as a matter of principle. The challenge in water bodies of this kind is not to turn back the clock in hydromorphological terms. It is to make sure that their chemical and ecological quality is sufficiently good to enable them to become and remain valuable systems.



The Netherlands without its dikes. The hydromorphology of all but a small proportion of the Dutch water system has been modified in the past for reasons of flood safety. If all these measures were reversed, more than half the country would be permanently inundated.

Densely populated delta



“In cases where a body of water is so affected by human activity or its natural condition is such that it may be unfeasible or unreasonably expensive to achieve good status, less stringent environmental objectives may be set on the basis of appropriate, evident and transparent criteria, and all practicable steps should be taken to prevent any further deterioration of the status of waters.”

– WFD, Preamble, para. 31

In Europe, as elsewhere in the world, river deltas are among the most densely populated, economically important and industrialised areas. This means that delta water systems are under heavy environmental pressure, quite apart from the fact that they often act as a collection point for pollution produced upstream.

The challenge

The specific problems of deltas play a major role in Dutch water management. Whereas only 5% of European waters lie in delta areas, in the Netherlands, the figure is more than half. And the pressures on waters in the Dutch Delta are enormous: the Netherlands is one of the most densely populated countries in the world, and several other European areas of similar population density and industrial activity lie directly upstream.

All of this produces enduring problems. For over thirty years, the Netherlands has been working hand in hand with neighbouring countries to reduce pollution in the major rivers. Billions of euros have been invested by the Netherlands alone and the results are apparent. Water quality has vastly improved, firm international agreements are being put in place about the management of the Rhine, Maas and Scheldt basins and salmon have returned to the Rhine. Even so, the recent analysis of river basins reveals that virtually all water bodies in the Netherlands are “at risk”. Clearly, still more needs to be done.

The dilemma

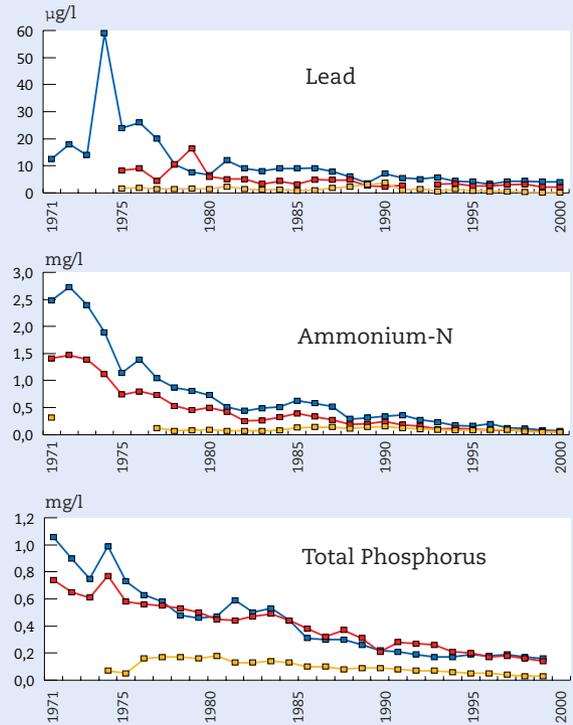
How can water quality be improved in an area where huge efforts have already been made over a number of decades and where it is hard to attract support for further investment?

The solution

Much of the solution lies in international coordination. This has proved successful over recent decades, especially in the Rhine basin. Discharges of industrial effluent and sewage have been greatly reduced. However, cross-border cooperation within river basins remains essential: 70% of the excessive nutrient levels in the IJssel can be traced to nutrient loads present in the Rhine before it crosses the Dutch border.

However, there are indications that more needs to be done. Once again, the Rhine is a good example of the problem. The percentage of wastewater that is treated before discharge into the Rhine is higher than that for any other river in the world. Every drop of Rhine water used by industry is treated before it is returned to the river. Flood defence measures take explicit account of the ecology, and the salmon – the symbol of the river's rehabilitation – is once again to be found in the

International coordination in river basins really works. Trends in concentrations of hazardous substances in the Rhine at the Weil (yellow), Koblenz (red) and Bimmen/Lobith (purple) monitoring stations.



higher reaches of the river, thanks to large-scale investment in fish ladders. But despite all this effort and success, virtually every water body in the Dutch part of the Rhine

basin is still “at risk”. It is already clear that it will be impossible to meet the standards for a number of problem substances by 2015, or that it will be possible to do so only by



Millions of euros have been earmarked for the restoration of wildlife and landscape features in the catchment area of this stream in Brabant. The stream is being returned to its original, meandering condition over a distance of 150 km. Fish ladders like the one in this photograph are being installed to provide access for fish species like trout and grayling. In addition, stringent restrictions are being imposed on the intensive cattle farms in the area, obliging them considerably to reduce their emissions of ammonia. Several dozen farmers may have to abandon their operations or relocate.

98%

of the Dutch population live in houses connected to mains sewers.
In 1985, this figure was 82%.

taking disproportionately expensive measures. In some cases, exemption in the form of relaxed standards will be unavoidable.

The Netherlands will not accept this situation without a struggle. Further efforts will be made to reduce remaining discharges and emissions but in some cases the only solution will be the passage of time. For example, the status of many groundwater bodies in the Netherlands is currently reduced by the leaching of nutrients and pesticides used in agriculture in past decades. The same principle is at work in the sedimentary areas of the Netherlands, where a lot of work is still required to deal with the consequences of many years of deposition and accumulation of contaminants.

Perhaps the most crucial realisation, however, is that – after all the years of effort – the hardest problems still remain. The substances that, according to the river basin analyses, threaten to cause the



greatest problems come mainly from diffuse sources, where emissions can be reduced only by extremely radical measures. For example, so long as the European economy continues to be based on the combustion of fossil fuels, emissions of PAHs will remain a problem. That is why current policy aims to reduce combustion emissions at source. But it is becoming clear that

national measures will not be sufficient to deal with the most intractable substances and that Community action will be required. In some cases, restricting the use of problem substances in products and processes will be the only real solution. Action to do this would do much to ensure the success of the WFD throughout the whole of Europe.



C R E D I T S

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