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Subject:	COMMISSION STAFF WORKING DOCUMENT Third River Basin Management Plans Second Flood Hazard and Risk Maps and Second Flood Risk Management Plans Member State: Netherlands Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC) Third River Basin Management Plans Second Flood Risk Management Plans

Delegations will find attached document SWD(2025) 32 final.

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Brussels, 4.2.2025
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COMMISSION STAFF WORKING DOCUMENT

Third River Basin Management Plans Second Flood Hazard and Risk Maps and Second Flood Risk Management Plans Member State: Netherlands

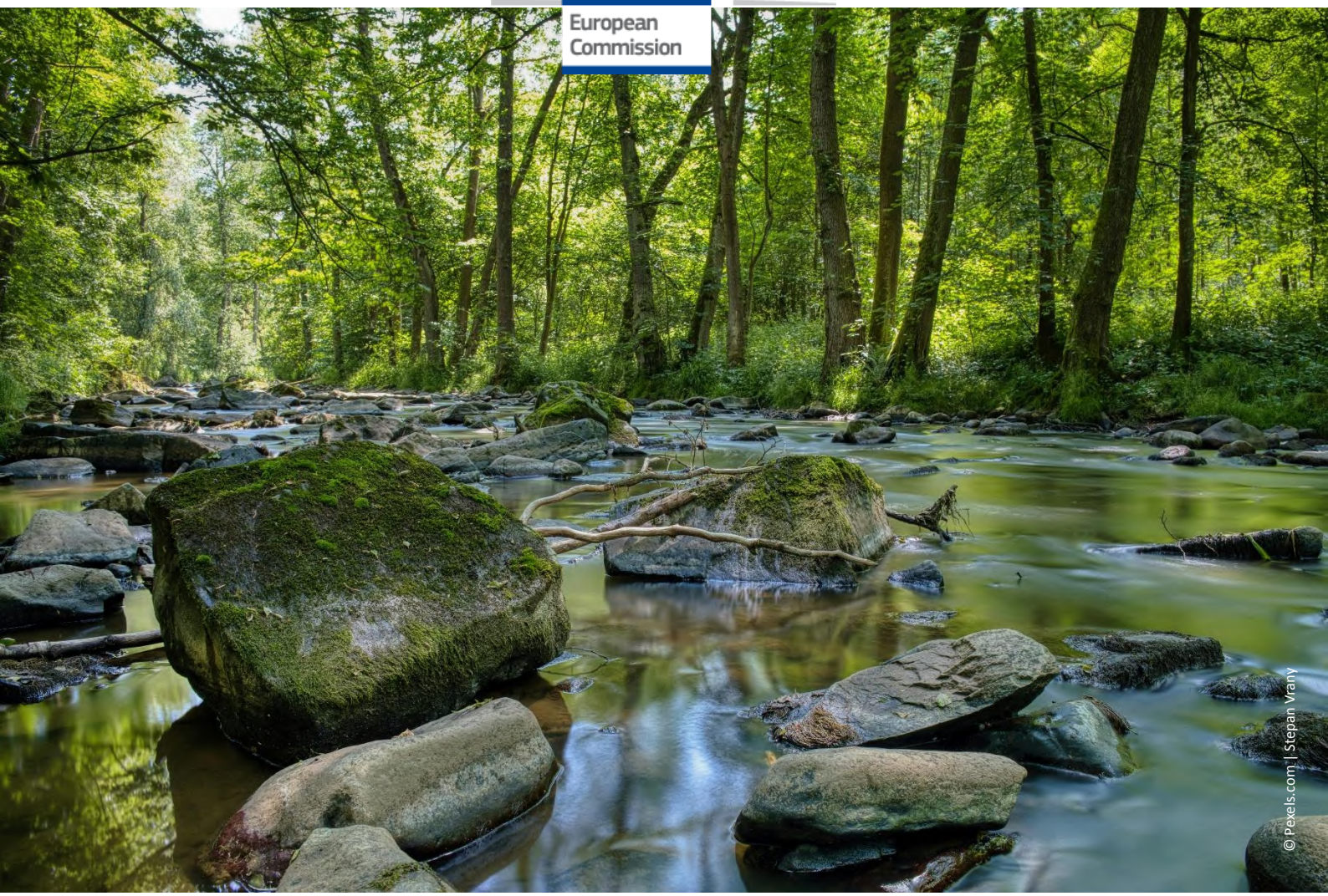
Accompanying the document

REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC)
Third River Basin Management Plans
Second Flood Risk Management Plans

{COM(2025) 2 final} - {SWD(2025) 13 final} - {SWD(2025) 14 final} - {SWD(2025) 15 final} - {SWD(2025) 16 final} - {SWD(2025) 17 final} - {SWD(2025) 18 final} - {SWD(2025) 19 final} - {SWD(2025) 20 final} - {SWD(2025) 21 final} - {SWD(2025) 22 final} - {SWD(2025) 23 final} - {SWD(2025) 24 final} - {SWD(2025) 25 final} - {SWD(2025) 26 final} - {SWD(2025) 27 final} - {SWD(2025) 28 final} - {SWD(2025) 29 final} - {SWD(2025) 30 final} - {SWD(2025) 31 final} - {SWD(2025) 33 final} - {SWD(2025) 34 final} - {SWD(2025) 35 final}

European Commission



Country specific staff working document

Netherlands

ENVIRONMENT

Content

SECTION A:

WATER FRAMEWORK DIRECTIVE

1. General info, Member State characterisation

The Netherlands is for a large part situated below the sea level (25% of surface area). It has a population of 17,4 million with a density of 500 persons per km2, almost 5 times the EU average. It hosts Europe's largest port and finds itself at the most downstream point of four international river basins (Rijn, Maas, Schelde and Eems). 54% of its territory is used for agriculture and the country is the world's n° 2 exporter of farm products and has the fourth largest greenhouse gas emissions per capita of the EU. All these elements create heavy pressures on the quality of its freshwaters. The Netherlands is (still) a water rich country but climate change may increase coastal and river flood risks and urban drainage, increase algae blooms and possibly also result in scarcity (in some areas). About one fourth of the country is designated Natura 2000 (160 areas), two thirds of which are 'open' freshwater. The whole country is designated as nitrate sensitive area under the Nitrates Directive.

The Netherland's 4 River Basin Districts count 745 surface water bodies (33 more than in the 2nd RBMPs) and 23 groundwater bodies. Most surface water bodies are heavily modified (286 HMWBs) or artificial (435 AWBs), only 24 are natural.

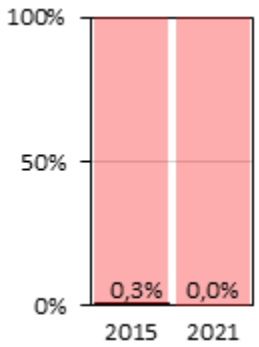
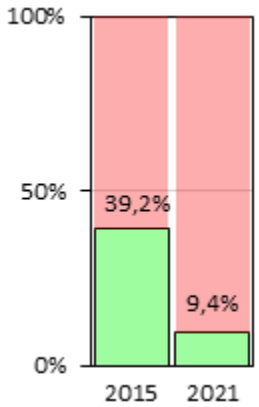
Reporting

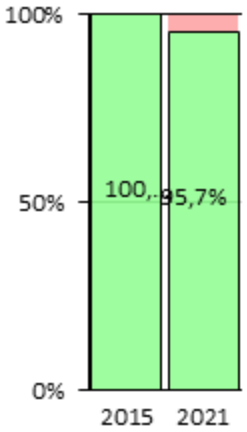
The deadline for reporting the 3rd River Basin Management Plans (RBMPs) was in March 2022. The Commission and the European Environment Agency (EEA) together with Member States developed an electronic reporting system in WISE (Water Information System for Europe). Its use was voluntary. Some Member States used it to fulfil their obligations, others reported the plans in pdf format. The cut-off date for the WISE e-reporting was September 2023 and the MS were assessed based on the datasets available by this date.

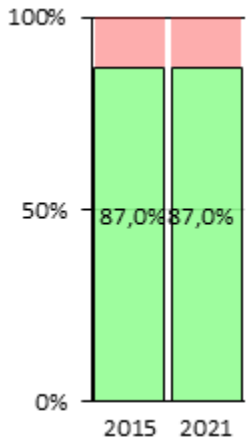
By September 2023 The Netherlands submitted full electronic reporting and therefore the assessment is based on this dataset.

Despite the cut off dates for the production of this report, reporting continued and, for the State of Water report, the EEA aggregated the results available by July 2024 in their products and dashboards available at WISE Freshwater web portal.

Changes in Status, Pressures, Exemptions & Measures

Surface Water Bodies (745)	Trend (% good status/potential)	Main Pressures & Changes & Exemptions
ECOLOGICAL STATUS		There is a very slight deterioration of the situation (0,3% to 0% in good status); however, there are less water bodies in bad and poor status. Also, the status of some biological quality elements has improved. Nevertheless only 5,2% of water bodies are expected to reach good status by 2027. The number of monitoring sites has seriously increased. Main drivers for pressures are dense population, land use, economic/agricultural activities, past pollution and transboundary pollution. This affects hydromorphology (canalisation, flood protection, agriculture), and results in pollution from nitrates, fertilizers/pesticides, and river basin specific pollutants. The Netherlands apply EQS for a very high number of RBSPs. The RBSPs that impact most water bodies are arsenic (67% of SWBs), cobalt (79%), selenium (64%), silver (42%) and zinc (39%). Pesticides affect 10% of SWBs and ammonium 70%. Art 4(4) exemptions apply to all SWBs, mostly for reasons of natural conditions and technical feasibility, disproportionate costs ranking third. Art 4(6) exemptions have seriously increased from 18 to 87. No exemptions under Article 4(5) are applied (no 'lowering of objectives').
CHEMICAL STATUS		Serious deterioration since the second RBMPs: from 39,2% of SWBs in good chemical status in 2nd RBMPs to only 9,4% in good chemical status in 3rd RBMPs. This may partly be due to increased confidence in status assessment and increased monitoring and stricter standards applying to some substances. Only 20% of SWBs is expected to reach good chemical status by 2027 (66% of SWBs will comply with EQS for non-ubiquitous priority substances and 49% will comply with EQS for ubiquitous chemicals). Only about 10% of priority substances cause bad status, most relevant are: polybrominated diphenyl ethers (PBDEs) (79%) fluoranthene (27%), mercury (26%), benzo(g,h,i)perylene (24,7%), benzo(b)fluoranthene (20%), tributyltin (15%), Benzo(a)pryene (6%), benzo(k)fluoranthene (5,8%). Mercury is responsible for the failure in 25% of the water bodies. This ubiquitous presence of mercury is common to many Member States, also as a result of long range air deposition from other continents. NL applies Art 4(4) WFD for all exemptions, on grounds of natural conditions (70%) or technical infeasibility (65%), only 12% on grounds of disproportionate costs.

Ground Water Bodies	Trend (% good status/potential)	Main Pressures & Changes & Exemptions
QUANTITATIVE STATUS		Only one GWB (4,3%) has deteriorated status compared to the 2nd RBMPs due to water balance. Three are at risk of not achieving good status by 2027, because of insufficient water for groundwater-dependent terrestrial ecosystems (2) and water balance. Out of the 23 GWBs, 15 have been identified for abstraction of drinking water. A more stringent method is used to determine the groundwater at risk compared to the 2nd RBMPs. The prolonged drought period in 2018 played a large role in the deterioration of status of one GWB, as the abstraction rate was much higher than the recharge rate. 4.3 % of GWBs have been exempted for quantitative status on the grounds of technical feasibility under Article 4.

CHEMICAL STATUS		No change since 2nd RBMPs; 3 out of 23 GWBs are in bad chemical status; top 3 pollutants affecting most GWBs are nitrates, chlorides, total phosphorus. For drinking water abstraction points, a trend assessment found 36 rising trends (approximately 10 % of all abstractions), as a result of impacts by the pesticide bentazone, arsenic and Nickel. Declining trends were identified for other pesticides, metals and nitrate. There is a slight decrease in the number of monitoring points, in particular for the purpose of operational monitoring. Also, there are no national threshold values for mercury, nitrites, ammonium and sulphate, but there are values for pharmaceuticals. By 2027, it is expected that two out of the 3 GWBs currently not in good chemical status will still be not be in good chemical status. The pollutants posing the risk include nitrate, chloride, pesticides and total phosphorus. Many of the exemptions under Article 4(4) are for reason of natural conditions, as more time may be needed for GWBs to recover from pollution.

2. Horizontal aspects

2.1 Governance

The Netherlands has timely reported, i.e. by the end of May 2022, one national RBMP covering four River Basin Districts (RBDs) and integrating their respective RBMPs. This is a change from the previous cycles, where four separate RBMPs were established and reported. All RBDs are international: the Rhine, which covers 69 % of the national territory, the Meuse, the Scheldt and the Ems. International RBMPs for all four RBDs have also been reported. The water governance is quite complex and decentralised, and sub-plans exist at different levels: the 12 provinces are responsible for groundwater management, the 21 regional water authorities for surface water management and the municipalities have a major role in sewage treatment. Water boards are in charge of implementation. The Ministry of Infrastructure and Water Management has a main role in preparing RBMPs and Programmes of Measures and for coordinating implementation.

This decentralised water management and delegation or devolution of responsibilities, which is in line with the Water Framework Directive (WFD), has the benefit of involving all actors. However, it may hamper progress if responsibilities are unclear, and the allocation of duties may leave some orphan tasks. This results for instance in delays to implement hydromorphological measures; insufficient enforcement of mandatory nutrient removal from sewage treatment plants; insufficient permit updates for activities impacting water quality and quantity; inadequate supervision and enforcement and unsolved spatial planning issues[1].

On the basis of available information, it is noted that the Netherlands provides a case of good practice for the public's involvement, as required by the WFD. The public has been appropriately consulted on timetable, work programme, overview of significant water management issues and draft RBMP for the required six months (internet, invitations to stakeholders, local authorities, media and meetings). Information on comments and how these were taken into account has been made publicly available[2]. Civil society is quite active in the Netherlands, and has taken the government to court, which has resulted in an obligation for the latter to increase its action to tackle climate change[3]. Such action will also benefit water quality and empowers civil society to step up action also in other areas. In 2019, a ruling by the Administrative Jurisdiction Division of the Council of State led to new measures under the Integrated approach to Nitrogen very much linked to nitrogen depositions and emissions. Since then, it is proving politically difficult to impose additional obligations on the agricultural sector to curb nutrients emissions.

All four RBDs are covered by international agreements (with a permanent cooperation body) and by international RBMPs. There is a coordinated approach to characterisation, monitoring, HMWB designation, exemptions, water abstraction/scarcity and pollution and coordinated databases and/or geographical information system. It is worth noting that strikingly, as regards the measures to be taken, these are rather left to the national plans.

[1] See in this respect recommendation one formulated by the 'Raad voor Leefomgeving en infrastructuur' an independent advisory body, in its Advisory letter "Good Water, Good Policy" of 11 May 2023

[2] Structuurvisie Nationaal Water Programma | Tweede Kamer der Staten-Generaal

[3] The Urgenda Climate Case against the Dutch Government was the first in the world in which citizens established that their government has a legal duty to prevent dangerous climate change.

The RBMP includes a chapter clarifying the coordination with other directives, including the Floods and Marine Strategy Framework Directives. In respect of the latter, there is also intensive international coordination and coordination on programmes of measures (e.g., in terms of addressing plastic pollution), in line with the requirements on governance set out in the WFD.

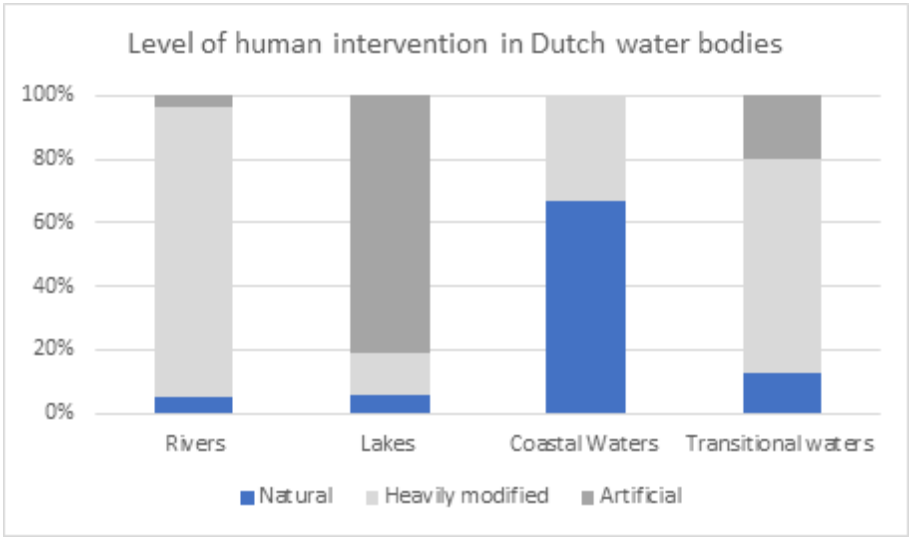
2.2 Characterization of River Basin District

In addition to the 'natural' types of water bodies, the Netherlands has also classified a lot of their water bodies as heavily modified and artificial, to take into account the high level of human intervention on their water bodies. This makes it impossible for the latter to achieve good status because that would prevent the water bodies to provide for the activities causing the modification/artificialisation (e.g., canal, ports, dams, flood protection). In the 'artificial water body' category, they have identified 12 artificial water types of ditches and canals. Instead, they will need to comply with the objective of good ecological potential, as further described in section 2.3.

Table 1. Overview of the Netherlands' River Basin Districts and the number of water bodies per RBD

RBD	Name	% national territory	Rivers number	Lakes number	Transitional number	Coastal number	Territorial	GWBs
NLRN	Rhine	69	127	369	3	4	1	11
NLSC	Scheldt	8	1	50	3	1	1	5
NLMS	Meuse	18	101	59	1	1	1	5
NLEM	Ems	6	5	14	1	1	1	2

Figure 1. Overview of level of intervention in Dutch waters



To benchmark and determine the status of water bodies, boundary values are set for the high/good (establishment of reference conditions) and good/moderate status classes. Good ecological status of

water bodies is established by comparing assessed monitoring data to these two boundary values. It is welcomed that the Netherlands has established reference conditions for all natural surface water body types for:

(1) biological quality elements (i.e. for macroinvertebrates, fish, phytoplankton and other aquatic flora[4] in accordance with the Intercalibration Decision of 2018) but not for fish and phytoplankton in very large rivers[5], nor for phytoplankton in coastal waters[6];

(2) all physico-chemical quality elements (including thresholds for nitrogen and phosphorus);

(3) hydromorphological quality elements (limited parameters for transitional and coastal waters).

The classification methodology for water types is included in a background document[7].

As required by the WFD, the environmental objectives have been reported in all RBDs. Additional objectives have also been set for water bodies associated with Protected Areas where so needed to ensure compliance with the requirements of the Directives applicable to those Protected Areas.

The RBMP establishes the main pressures that are exerted upon them.

The main pressures on surface waters come from agriculture, atmospheric deposition, other diffuse pollution and transport; in addition, there is considerable pressure from dams, barriers and locks; the most relevant impacts are chemical pollution (87%), organic pollution (85%) and nutrient pollution (73%). Of particular concern are the family of polybrominated diphenylethers (PBDEs, ubiquitous) which cause the biggest number of surface water bodies to fail good chemical status. There is an improvement as regards nutrient pollution (13% decrease) but regrettably a significant exacerbation of chemical pollution (+37%) compared to the previous cycle. A recent study has assessed the sources of PFOS and other PFAS. There still seems a lack of identification of sources of ammonium partly because of the dynamic character of its concentration (impact of temperature) and uncertainty of natural background levels in groundwater (associated with surface water). In terms of river basin specific pollutants, it needs to be recalled that the Netherlands is monitoring a very high number of pollutants in surface water, more than 80[8], which they consider are of concern in their territory. This pollution takes different forms, and some pollutants are much more present than others. While not explicitly mentioned in the RBMP, invasive species (e.g., invasive crayfish) can also cause problems insofar as they disrupt the freshwater ecosystem by their burrowing and grazing behaviour.

The main pressure on groundwater comes from diffuse pollution, the main driver behind that pressure being agriculture and other sources resulting in organic pollution (52%), chemical pollution (50%) and damage to groundwater-dependent terrestrial ecosystems (39%). This has not changed compared to the 2nd RBMP. As regards other possible pressures, the problem of overexploitation of groundwater compared to the replenishment rate remains limited (currently only affecting one groundwater body) but the situation is expected to deteriorate by 2027.

[4] Justification accepted in the context of the Intercalibration exercise, for not using phytobenthos in all types

[5] NL considers phytoplankton not a mandatory BQE to be assessed in large rivers; for fish, the method could not be intercalibrated due to an insufficient number of samples

[6] However, for chlorophyll-a (phytoplankton) for coastal waters, the Netherlands has doubts that these values are suitable and started an investigation with Germany

[7] STOWA 2018-49 Maatlatten - 2020v4.pdf

[8] These are the so-called river basin specific pollutants, which are part of the specific physico chemical quality elements supporting good ecological status

Figure 2. shows the pressure from agriculture on the trophic status of surface water, based on monitoring under the Nitrates Directive

Source: JRC NITRATES DIRECTIVE - Reporting Period 7 (2016-2019) Trophic Status[9]

There are factsheets available for each water body, which describe the water body, its objectives, its current status, pressures and impacts, measures and a summary of the exemptions and related justifications[10].

3. Policy elements contributing to biodiversity and climate change adaptation

3.1 Surface Water: what is their ecological status or potential

Monitoring

The Netherlands has enhanced its diagnosis capacity. Indeed, the number of monitoring points has considerably increased (+ 17%) compared to the previous cycle[11]. There are two types of monitoring: i) operational monitoring to determine the status and which covers all water bodies at risk and ii) surveillance monitoring aimed rather at identifying impacts and long-term changes and design

[9] Link available at: Nitrates Directive - Reporting 7 (europa.eu)
[10] KRW-factsheets | Het Waterkwaliteitsportaal
[11] Monitoring water | Informatiepunt Leefomgeving (iplo.nl)

monitoring programmes, covering 37.2 % of river lengths, 84.6 % of lake area, 91.6 % of transitional water area and 91.6 % of coastal water area.

As regards operational monitoring, the country applies a risk-based monitoring, that means that not all biological and physico-chemical parameters are monitored in all water bodies but rather representative water bodies are used for monitoring and the results are extrapolated to other water bodies subject to similar pressures and impacts. This is in line with the WFD. The status is based on the most recent monitoring results (which can differ per substance or location).

As regards surveillance monitoring, contrary to operational monitoring which only monitors the relevant parameters (i.e. the parameters sensitive to the pressures affecting a specific water body), surveillance monitoring covers all biological quality elements. For rivers, lakes and transitional water bodies, these are phytoplankton, macrophytes, benthic invertebrates, and fish (not phytobenthos[12]), whereas for coastal water bodies phytoplankton and benthic invertebrates. However, in two of the coastal waters other aquatic flora (eg angiosperms) is also monitored.

All general physico-chemical quality elements (nutrients, oxygenation, transparency, thermal conditions, salinity conditions, acidification) are now monitored in most water body types, except for coastal water bodies where only nutrient and oxygenation conditions are monitored.

According to the available information, hydromorphological quality elements are not monitored under any monitoring programme. Nevertheless, in the 'ex ante analysis' the current hydromorphological conditions and the expected conditions are taken into account in the models to assess biological status (for quality elements sensitive to hydromorphological changes).

In conclusion, while the number of monitoring stations has increased and biological and physico-chemical parameters are, in general, well covered, the monitoring of hydromorphological quality elements (hydrology, morphology, continuity) seems insufficient, considering that several biological quality elements are sensitive to hydromorphological changes. For some coastal water bodies, 'other aquatic flora' and several general physico-chemical quality elements seem insufficiently monitored and hence not used for status assessment. For details on frequencies, the RBMP refers to the Monitoring and Status Assessment Protocol[13].

Status assessment

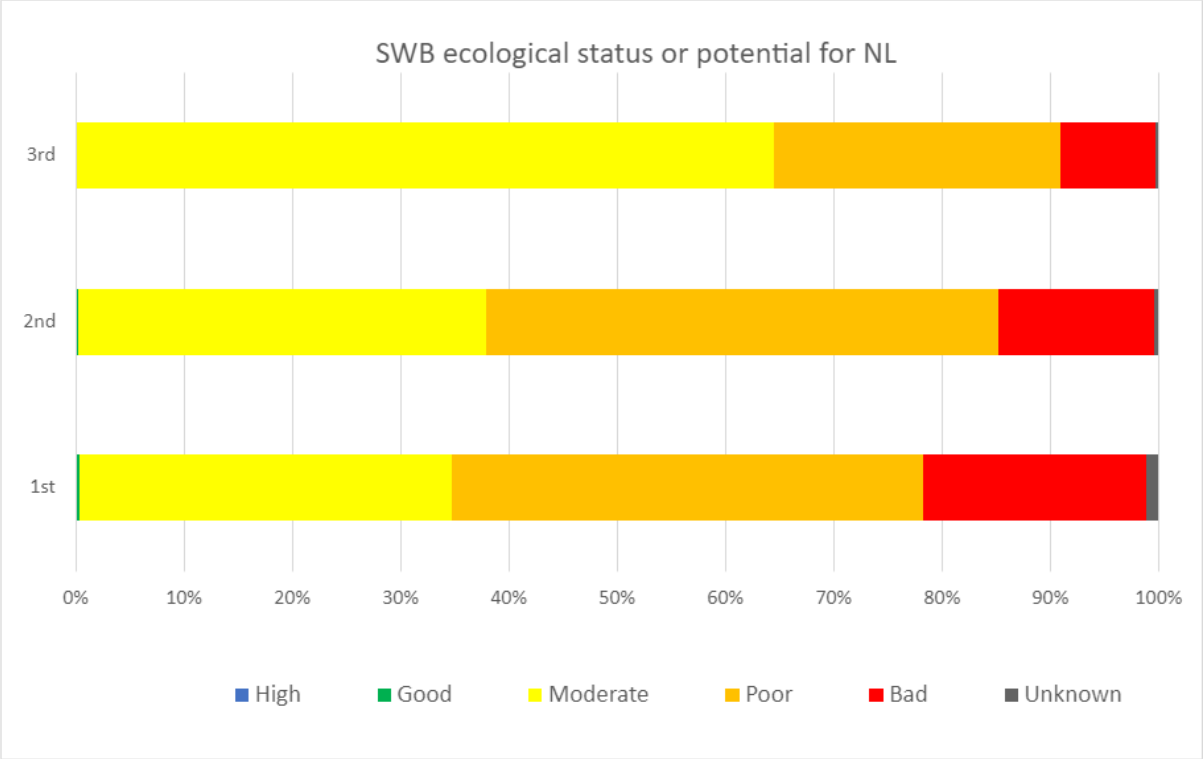
Surface water

In the 3rd RBMP, there are no surface water bodies in good ecological status/potential and 64.2 % (478) in moderate status/potential, 26.3 % (196) in poor status/potential and 8.7 % (65) in bad status/potential. Only 0.8 % (2) are in unknown status.

[12] Justification accepted in the context of the intercalibration exercise

[13] https://www.helpdeskwater.nl/publish/pages/162259/protocol-monitoring-en-toestandsbeoordeling-krw-errata-verwerkt-2021.pdf

Figure 3: Ecological status or potential of surface water bodies (SWBs) in the Netherlands in the 1st, 2nd and 3rd RBMPs

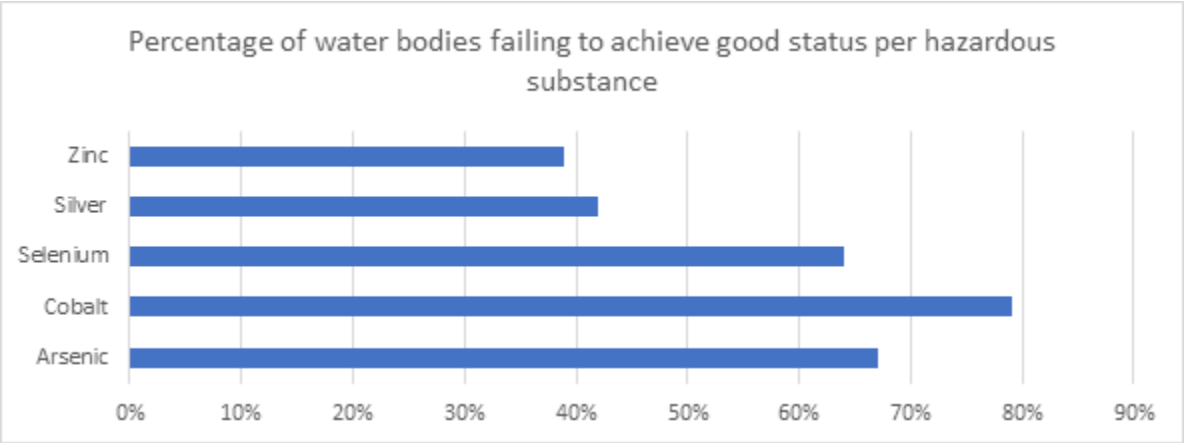


Source: WISE electronic reports

The above figure 3 shows that the number of water bodies in good status/potential remains extremely low and actually has decreased over the cycles from 0.3% to zero. What has been happening over the 3 cycles is a positive gradual shift from bad to poor to moderate- with a steady reduction of surface water bodies in bad status and the number of surface water bodies in poor status progressively declining. While this is undoubtedly a beneficial evolution, it is not good enough to make water bodies flip from bad to good.

This is because, as required by the law, if one parameter is beyond the allowed limit, the status is considered bad (the 'one out all out' principle or in other words the status is determined by the quality of the elements in the lowest class). That means even if the status is improving from bad to poor or from poor to moderate, this will not be reflected in the classification of the water body which would still not be 'good'. For the Netherlands this means that there is no change of overall status between the 3 cycles. It must be highlighted that the Netherlands has established environmental quality standards for 80 pollutants of national concern ('river basin specific pollutants' or RBSPs).

Figure 4: most problematic pollutants (metals) causing failure to achieve good ecological status/potential



As regards, non-metals, the most problematic is imidacloprid (pesticide) seriously affecting 10% of water bodies and ammonium affecting 70% of the water bodies. Almost 70% of all water bodies comply with thresholds for nutrients (N and/or P), and 55% of all inland freshwaters, which is a clear improvement as compared to the 2nd RBMPs. By 2027, 75% of surface water bodies are expected to comply with nutrient thresholds. However, the Netherlands still benefit from a derogation under the Nitrates Directive until December 2025[14], allowing to spread more manure on the fields.

Overall, considering pressures from chemicals and nutrients, and the application of the one-out-all-out principle, at the current pace of improvement, it is not surprising that the Netherland expects that by 2027 only 5.2 % of surface water bodies will be in good ecological status/potential.

Nevertheless, the status of some biological quality elements has improved. This is in particular the case for fish and phytoplankton. Also, some general physico-chemical quality elements have improved status (transparency, oxygen), reflecting improved biology. Temperature and chloride are more problematic, due to recent warmer summers. Hydromorphological quality elements have not been assessed for status because these are only relevant for water bodies in high status or maximum potential of which there are none.

According to four Dutch knowledge institutes, the current plans are insufficient to reach climate, nitrate and nature targets. To solve the problem, farmers would need to implement far more costly and far-reaching measures on their farms whereas, in order to achieve the nature and water targets, much more nature is needed than currently agreed[15].

3.2 Hydromorphological changes and artificialization (HMWBs and AWBs)

As shown in the below table, the level of human intervention in the Dutch water bodies is unparalleled in the EU.

[14] Publications Office (europa.eu)
[15] Plannen voor natuur, stikstof en klimaat onvoldoende om doelen te halen (nos.nl)

Table 2: Level of human intervention in Dutch water bodies

Modifications	Rivers	Lakes	Transitional waters	Coastal waters
HEAVILY MODIFIED - total 38% of all SW	91%	14%	67%	33,3%
ARTIFICIAL - total 58% of all SW	4%	86%	20%	0%

The main physical alterations affecting the water bodies are: channelisation/straightening/bed stabilisation/ bank reinforcement, weirs/dams/ reservoirs and land drainage (river water bodies)/locks (all other types). The most common reasons driving alterations are flood protection, navigation and ports. For artificial water bodies (AWBs), no information could be found on the reasons for their creation.

The RBMP only briefly describes the methodology to designate a water body as HMWB, referring for details to factsheets provided at water body level[16]. These explain for each water body the sustainable human development activities or pressures causing the water body to be considered as heavily modified and the resulting limits for taking measures towards good ecological potential. They also clarify the lack of technically feasible and non-disproportionately costly better environmental options (i.e. less disturbing or not disturbing to water bodies) to achieve the same objectives.

According to the WFD, and given their very man-made characteristics, the HMWBs and AWBs must only meet the objective of good ecological potential (GEP) rather than good ecological status (GES).

Like for GES, GEP is defined in relation to a reference condition which is the maximum ecological potential (MEP), i.e. the biological status (algae, aquatic flora, macrofauna and fish) reflecting as far as possible that of the closest comparable surface water body taking into account the modified characteristics of the HMWB/AWB. Physico-chemical quality elements are also taken into account, via their relationship with biology. It is to be welcomed that the Dutch method for assessing GEP has improved since the 2nd RBMPs. For canals and small waterways, the GEP is compared to the GES of the canal with the highest quality in the Netherlands. Chapter 5.4.3 of the national RBMP summarizes the mitigation measures that have been applied to compensate as much as possible the adverse ecological effects of the physical alteration. They are reported in the factsheets and refer to a national guideline for assessment of the effects of mitigation measures on GEP and calculation of their significance[17].

No water bodies have been classified as being in MEP or even GEP. This is also due to non compliance with environmental quality standards (for River basin specific pollutants), which equally apply to natural and heavily modified/artificial water bodies.

[16] Available at: https://www.waterkwaliteitsportaal.nl/krw-factsheets
[17] https://www.stowa.nl/sites/default/files/assets/PUBLICATIES/Publicaties%202018/STOWA%202018-15%20handreiking%20defdefversie.pdf

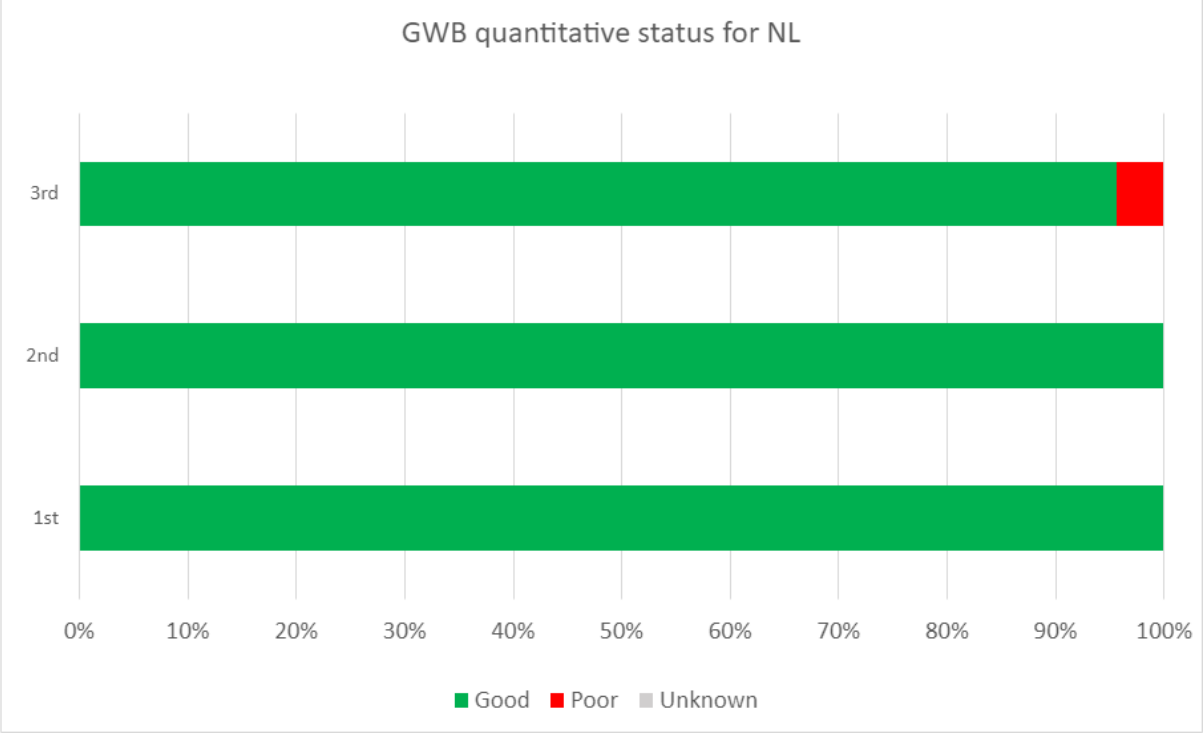
3.3 Groundwater bodies - have they sufficient water – quantitative status

Groundwater abstractions and artificial recharges are registered, in line with the WFD. Abstractions are not considered a significant pressure, as the overall water balance of most groundwater bodies is positive.

In all RBDs, and as required by the WFD, groundwater bodies are associated with one or more surface water body and as a result of this, groundwater associated aquatic ecosystems (GWAAEs) are taken into account in quantitative status assessment. The same applies to groundwater dependant terrestrial ecosystems (GWDTEs).

In the face of growing precipitations changes, it is positive that all groundwater bodies except one are in good quantitative status. The latter has deteriorated to poor quantitative status due to abstraction exceeding recharge, as a result of the drought period in 2018 in the Meuse RBD. However, for the future, in addition to the groundwater body already currently in poor quantitative status, two more are at risk of not meeting good quantitative status in 2027, as a result of significant pressure from agriculture affecting groundwater dependent terrestrial ecosystems. The Dutch government intends to implement 46 recommendations to make the Netherlands more resilient to periods of drought.

Figure 5: Quantitative status of groundwater bodies (GWBs) in the Netherlands, in the 1st, 2nd and 3rd RBMPs



Source: WISE electronic reports

3.4 Protected Areas (identification, monitoring, objectives and measures)

There are different types and reasons why certain water bodies are protected under the law. For surface water bodies, protected areas have been designated under the Drinking Water, Bathing Water, Habitats and Birds Directives as well as for areas designated for the protection of economically significant aquatic species (e.g. aquaculture). The whole country is designated as Nitrates Vulnerable Zone under the Nitrates Directive. However, no sensitive areas have been designated under the Urban

Wastewater Treatment Directive. It must be noted, though, that all urban wastewater treatment plants must ensure at least 75% reduction of nutrients (phosphorus and nitrogen) in the wastewater before it is discharged. Currently, 26,5% of the non-marine area of the Netherlands is covered by areas that are protected as Natura 2000 sites under EU nature legislation[18] or as nationally protected areas. While this value is slightly about the EU average of 26.4%, one has to keep in mind that most of the Dutch protected areas are water surfaces. The EU Biodiversity Strategy has set a target of reaching 30% protected area coverage at the EU level by 2030.

For groundwater, protected areas have been designated under the Drinking Water, Habitats and Birds Directives. Indeed, 15 groundwater bodies are identified as drinking water protected areas, of which 7 are transboundary.

Table 3: Number of protected areas, per type of area and associated water body

Protected area type	Number of Water Bodies Associated with protected areas in					
	Rivers	Lakes	Coastal	Transitional	Territorial	Groundwater
Bathing waters	12	64	7	3	0	0
Drinking water protection area	6	5	0	0	0	15
Natura 2000	67	153	9	4	4	20
Shellfish designated water	0	2	8	2	4	0

Additional objectives have been set for both surface and groundwater pertaining to Natura 2000 protected areas[19], Shellfish (for microbiological contamination) and Drinking Water Directive protected areas (to maintain the water quality).

Separate monitoring networks have been established, sometimes overlapping with monitoring under the respective directives.

The RBMP summarizes additional measures for protected areas. Moreover, under the Nature Pact €415 million of yearly funding goes to measures aimed at achieving the objectives of Natura 2000 and Water Framework Directives. In addition, since 2021, €300 million of yearly funding goes to the restoration and protection of nature. Overall, the additional objectives for protected areas seem covered by an appropriate number of specific measures (including creation of special habitats for fish, for flora and fauna, construction of purification wetland, vegetation and water quality management, planting of vegetation along water bodies, managing of large-scale groundwater contamination, restricting of recreational use and shipping, change in agricultural use, financial measures, communication, legislative changes).

There is no information on the actual achievement of the additional objectives. It is positive that the share of surface water bodies associated with protected areas, which are in poor ecological status or potential, has decreased and the majority (56.4%) is now classified in moderate status/potential. On the other hand, an opposite trend is seen for the chemical status of such bodies which has deteriorated

[18] Netherlands (europa.eu)
[19] See: Landelijk Meetnet effecten Mestbeleid | RIVM

and 88.2% are now failing good chemical status. Regrettably quantitative status of groundwater bodies associated to protected areas has slightly worsened[20]. This would lead to conclude that the special measures as well as the additional objectives set for those protected areas are clearly insufficient to address the pressures from chemical pollution, whereas they seem to have produced positive effects on biological parameters.

3.5 What is being done to prevent/reduce hydromorphological pressures

River continuity has been identified as an overall management objective for all four RBDs and measures include bypass channels, fish ladders, development of an inventory of barriers, removal or adaptation of dams.

It is welcomed that there is an authorisation regime in place to control physical modifications to the riparian area of water bodies; there is a systematic revision of permits to address hydromorphological alterations, often associated with water availability and quality in Natura 2000 areas. It is reported that new and modified structures, including upgrade of flood defences, storage dams and tidal barriers, have been adapted to take into account WFD objectives. However, it is not clear if such projects have, as required by the WFD, been made subject to a preliminary assessment of their impacts and, where so required because of likely negative impacts, whether the necessary justification has been provided and mitigation measures planned and implemented. This may be due to the implementation of policy rules to avoid deterioration of ecological status due to new developments[21].

Yet as mentioned above, the level of human intervention is very high and since a large part of the country is under the sea level, flood protection is one of the main hydromorphological pressures. Agriculture also triggers a very large number of these alterations. The programme of measures identifies pressures caused by drainage and soil erosion or sediment run offs.

The RBMP includes measures to address diffuse pollution from urban runoff (59 water bodies) and agriculture (563 water bodies). Other measures tackle the physical alteration due to i) flood protection (82 water bodies concerned), ii) agriculture (151 water bodies concerned), navigation (30 water bodies concerned) and other pressures (94 water bodies concerned), as well as hydrological alteration due to agriculture (149 water bodies). Measures to improve hydromorphological conditions other than longitudinal continuity include habitat restoration, reconnection of meander bends or side arms, lowering of riverbanks, restoration of bank structures, inundation of flood plains, restoration of modified bed structures, measures to improve flow regime and/or establishment of ecological flows; measures to improve water efficiency in irrigation, industry, energy and households; natural water retention measures.

The RBMP includes 'win-win' measures to achieve objectives of the WFD and Floods Directive and address drought management in the form of 'Natural Water Retention Measures'. It does not include specific information as to whether ecological flows have been established in regulations, but there are measures aiming towards a natural hydrological regime, gradual transition between fresh and

[20] water-scarcity report final.pdf (panda.org) a recent WWF report highlights a case of dysfunctional controls on groundwater extraction in The Netherlands in and around Natura 2000 sites, e.g. the Holtingerveld (province of Drenthe), characterised by insufficient groundwater levels to sustain terrestrial ecosystems, yet the Province failed to request the appropriate assessment under the Habitats Directive prior to authorising abstractions (25 other Natura 2000 sites in the Sand Rhine-East catchment would be in a similar situation)

[21] Staatscourant 2022, 6470 | Overheid.nl > Officiële bekendmakingen (officielebekendmakingen.nl)

seawater, as well as control of water levels in case of droughts. Nature-based solutions, such as nature friendly river banks, have been included for some but not all RBDs.

The RBMP reports progress on hydromorphological measures, but only 50% of all measures (set out in the 2nd RBMPs) have been implemented or their implementation has started, in sharp contrast to measures addressing other pressures, 95% of which have been implemented or are on-going. This seems mostly due to the difficulty to buy the land necessary to implement the measures, as well as to the need for a staged approach of these measures, which are interlinked, therefore implementation of one is a pre-condition for implementing another one. Nevertheless, it's worth noting that the Rhine and Ems RBD show good progress on measures to widen rivers and create nature-friendly river banks (respectively 79% and 94% of all such planned measures implemented), In the Maas RBD, all measures that were aimed at enhancing the water systems, including the creation of wetlands and lowering of floodplains (within the concept of "Room for the river" project) have been implemented. In terms of closing the gap for hydromorphological pressures expected between 2021 and 2027, the RBMP includes indicators and lists the number of measures to be implemented, by category. By 2027, in total 1500 fish migration bottlenecks will have been restored and 40 % of the total stream length will reach a state closer to natural. Therefore, it is estimated that by 2027 at the latest, the hydromorphological status of water bodies will mostly be restored within the framework conditions set by the WFD.

3.6 What The Netherlands is doing for abstractions and water scarcity

There are permitting regimes in place, as well as registers for both abstraction and impoundment, and measures to promote water efficiency in all water use sectors and RBDs, as required by the WFD. However, some abstractions below certain thresholds are exempted from permitting and controls (to note that the WFD allows to exempt abstractions which have no significant impact on water status). Only very large abstractions from surface water bodies are subject to prior authorisation (> 50 m3 per hour); Abstractions from groundwater bodies are subject to prior authorisation if above 150.000 m3 per year for industrial purposes, or if for the purpose of drinking water supply or for the purpose of soil energy systems. In all other cases, it will depend on local regulation.

The RBMPs provide for specific conditions under which permits can be refused or revised, in view of maintaining or achieving the environmental objectives. However, there is no obligation for periodic review of those permits, as required under the WFD. Inspections are in place to verify illegal abstractions or violation of permit conditions. The Meuse, Scheldt and Rhine RBMPs also refer to international coordination activities (e.g. joint monitoring, planning, stakeholder engagement, measure implementation, management of low flows).

Only one groundwater body out of 23 (4.3 %) failed to achieve good quantitative status by 2021 for reason of significant pressures from water abstraction. However, two more groundwater bodies are at risk of not achieving good quantitative status by 2027. This is not for reason of water abstraction but due to pressures from diffuse sources of pollution damaging groundwater-dependent terrestrial ecosystems. All three groundwater bodies are located in the Meuse RBD.

For surface water bodies, water abstraction has only been identified as a significant pressure for 8 river water bodies (3.4 % of total river water bodies) and 22 lake water bodies (4.5 % of all lake water bodies) failing to achieve good ecological status/potential, all in the Meuse and Rhine RBDs. This means a notable reduction as compared to the 2nd RBMPs, where water abstraction was significantly affecting 42 river water bodies, 72 lake water bodies and 2 transitional water bodies in the Meuse, Rhine and Scheldt RBDs.

Based on national statistics[22], the major users are (in descending order): electricity generation, industry, households and services, and agriculture. It is worth noting that despite the efforts on water efficiency, since 2015, water consumption is increasing for public water supply and agriculture[23].

Basic and supplementary measures are in place for the control and management of water abstraction and impoundments (controls, technical measures for irrigation, efficient water use, improvement or establishment of ecological flow regime).

The Netherlands are studying possibilities to promote water reuse as a possibility to reduce water abstractions[24].

There is also international cooperation on water abstraction/scarcity issues, in particular on low flows (e.g. Meuse, Rhine). The programme "Rhine 2040 – The Rhine and Its Catchment Area: Sustainably Managed and Climate-Resilient", launched in February 2020, aims at improving sustainable management and climate resilience in the Rhine RBD.

3.7 Adaptation to climate change

The RBMP contains a section dedicated to climate change, describing general effects of climate on biology, chemical and general groundwater and surface water quality. It provides general advice on how to maintain good water quantitative status of groundwater and prepare for droughts and refers to energy transition as a potential approach to address climate change impacts on water (e.g. tidal energy or wind/solar farms). It also refers to the National Climate Change Adaptation Strategy as a vehicle to address, amongst others, water issues. The international river commissions have developed four international climate change adaptation strategies, integrated in the RBMP.

The long-standing Delta Programme[25] to combat the consequences of and to cope with climate change covers i) protection against flooding (strengthening dikes, maintaining coast with sand nourishment, creating more room for rivers to reduce the risk of flooding), ii) adequate supplies of fresh water for both drinking and agriculture and iii) climate-resilient spatial planning.

The strategy and actions in the Delta Programme on Freshwater are carefully aligned with the PoM of the WFD at national and regional levels and reinforce the WFD measures where possible.

Flood management

The Floods Directive requires to consider the impacts of climate change on the occurrence of floods, and therefore in the preparation of Flood Hazard and Risk Maps (FHRMs) and Flood Risk Management Plans (FRMPs). More information on these can be found in Section B. However, considering the close relationship between overall water management and floods management and the importance of climate change effects on both, climate change effects are jointly addressed in this section.

Since the big flood disaster that happened in 1953- Watersnoodramp- causing almost two thousand casualties and a very considerable damage, flood control has been constantly enhanced in the country,

[22] Statistics | Eurostat (europa.eu)

[23] It should be noted however that conventional statistic abstraction data of Eurostat, EEA and OECD do not take account of evaporation /leakages of water stored in reservoirs further to abstractions. Leakage and evapotranspiration losses can however be significant in MSs with many reservoirs and/or older irrigation and distribution systems.

[24] Een verkenning van de acceptatie van waterhergebruik in Nederland (h2owaternetwerk.nl)

[25] More info on past and future programme: 2024 Delta Programme | Delta Programme | Delta Programme (deltaprogramma.nl)

particularly as climate change progresses and with increasing sea level rise. These efforts have led to the largest flood defence system in the Netherlands, known as Delta Works.

However, climate change effects were not included in the maps of the 1st Flood Hazard and Risk Maps (FHRMs). In the 2nd FHRMs the need to address the impacts of climate change is also not explicitly reported. Moreover, the Manual "Flood Risks on the Map" indicates that for the Areas of Potential Significant Flood Risk (APSFRs), the current risks are assessed and the potential future effect of climate change on the size of a flood is not being taken into account.

On the other hand, as opposed to the 1st FRMPs, , the 2nd FRMP does mention the national climate strategy, together with related policy documents. Climate scenarios prepared by the Royal Netherlands Meteorological Institute (KNMI) were used for the 2nd FRMP. These are based on the scenarios developed by the International Panel on Climate Change (IPCC). The KNMI's scenarios project that climate change will bring higher temperatures, more rapid sea-level rise, wetter winters, heavier rainfall, and the possibility of drier summers. Areas not protected by flood defences can expect a larger area experiencing more frequent occurrences of flooding. Pluvial floods are also expected to increase and will be further assessed for the 3rd FRMP. On intense rainfall events (flash floods), the FRMP states that municipalities have undertaken work to reduce the vulnerability of urban environments, but it is unclear how many municipalities have undertaken this work, or plan to do so. The FRMP also states that, for the 3rd FRMP, the Netherlands will evaluate whether intense precipitation poses a significant risk of flooding.

Drought management

Although not a formal requirement under the WFD, following the 2018 drought, a drought management plan was put in place to advise relevant institutions and raise awareness, formulating 46 recommendations to prevent deterioration, support resilience to droughts and promote restoration. Equally, droughts are the most assessed and addressed climate change impacts in the 3rd RBMPs. The economic impacts are disruption of navigation and damage to crops; whereas the environmental impacts are increased land subsidence due to low water tables, increased salt intrusion and increased pressure on nature/green areas.

Climate change adaptation measures

The RBMP provides concrete measures to prevent deterioration, support resilience and promote restoration: 1) measures to broaden canals, e.g. the "Room for the River" programme[26], where the relocation of dikes and the construction of side (new) channels have increased safety against flooding while also expanding habitats for plants and animals, increasing the control over water flows, and increasing infiltration capacity through the establishment of nature-friendly embankments; 2) awareness raising and 3) drought management plans that advise relevant institutions on measures during drought periods.

4. Policy elements contributing to zero pollution

4.1 Surface Water: what is their chemical status

Monitoring

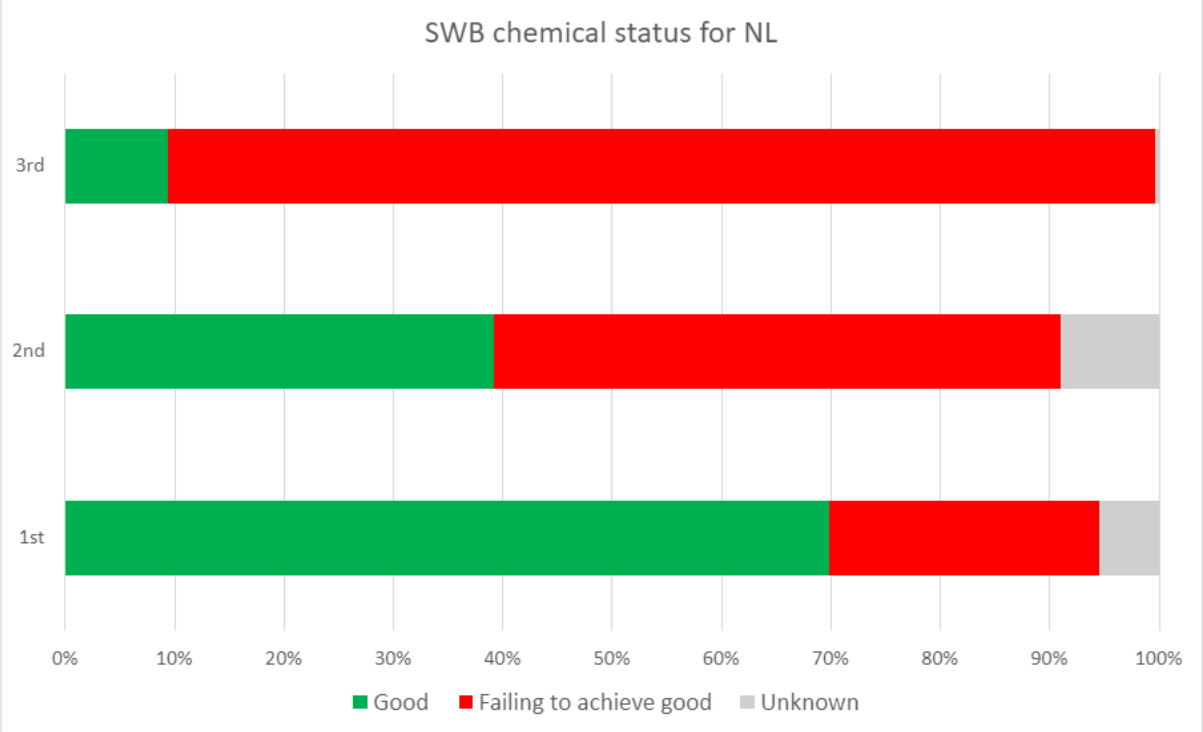
[26] Room for the River explained | Dutch Water Sector

The Netherlands has updated its monitoring methods, strategically deploying monitoring sites to maximise the understanding of chemical status across different surface water body types. The total number of sites has increased from 711 to 745 (significant increase in lakes, yet a decrease in rivers).

Grouping approaches have been used for status assessment, even though the WFD requires monitoring in all water bodies in which priority substances are discharged. Very detailed information[27] is given on how the state of surface water has been established. It has been done with a combination of in-situ monitoring, grouping and modelling. However, for what concerns monitoring of the eleven priority substances for which an EQS in biota has been set, which must be monitored in biota once a year, it seems that a reduced frequency is applied without this being justified.

Status assessment – Evolution of chemical status of surface water bodies since the first RBMPs

Figure 6: Chemical status of surface water bodies (SWBs) in the Netherlands in the 1st, 2nd and 3rd RBMPs



Source: Wise electronic reporting

A good element is that the status is known for all water bodies and there are no knowledge gaps. On the other hand, only about 10% of surface water bodies are in good chemical status: 11% of riverine water bodies, 4% of lakes and 0% of transitional and coastal water bodies.

Moreover, the number of water bodies in good status has dramatically and steadily decreased over the three cycles from 70% to 39% to 9%. To explain this negative deterioration trend, there might be different reasons: i) the accuracy of measurements has considerably increased ii) the number of substances monitored has also increased and the limit values rendered more stringent. It needs to be highlighted that the new substances added at European level in 2013 have not been taken into account in this cycle for the assessment. However, although it might not be possible to rule out increasing

[27] SGBP-achtergronddocumenten | Het Waterkwaliteitsportaal.

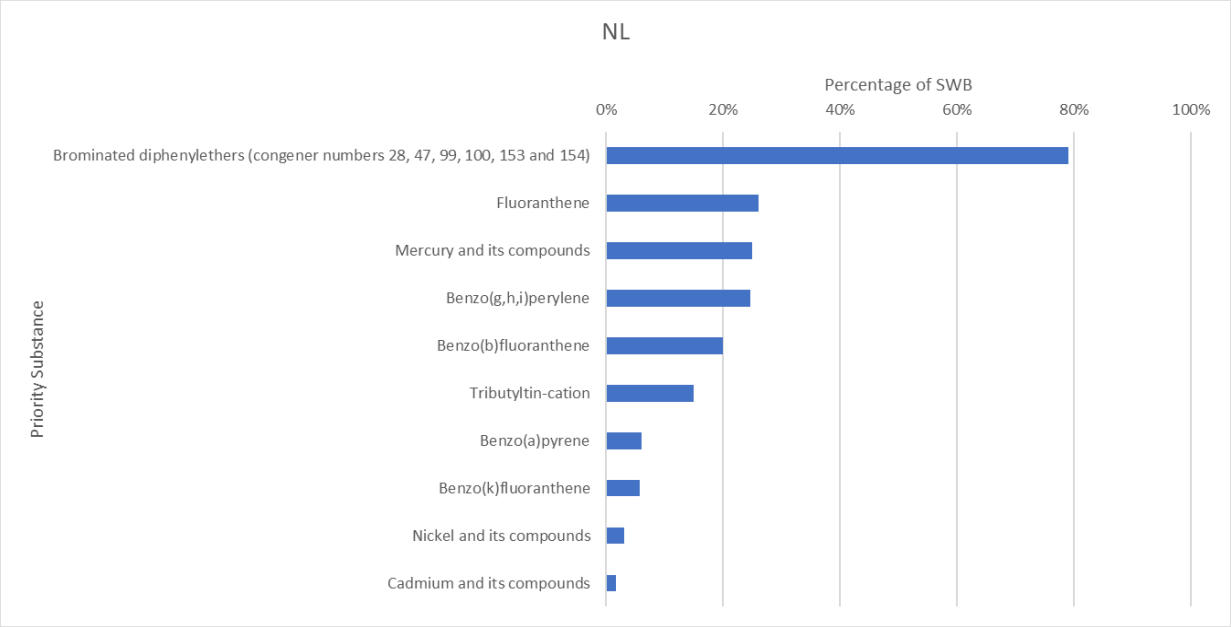
pollution loads, measures taken to reduce mercury emissions and to enhance air quality should bring along some positive reductions in some of the most common pollutants.

Most failures to achieve good chemical status are associated with a small subset of substances. In top position are polybrominated diphenyl ethers (PBDEs) – heavily used in paints, plastics, foam furniture padding, textiles, building materials and industrial processes- they cause the failure of 79 % of water bodies. Then comes a group of substances coming from crude oil and combustion processes fluoranthene (26 %), benzo(b)fluoranthene (20%), benzo(g,h,i)perylene (24,7%), Benzo(a)pyrene (6%), benzo(k)fluoranthene (5,8%) and the widely used biocide tributyltin (15%).

Worth highlighting is the case of mercury that is responsible for the failure in 25% of the water bodies. This ubiquitous presence of mercury is a common phenomenon in many Member States and has triggered a myriad of actions in the EU to act at source and prohibit its use in many products. Major sources still remain from (long range) transboundary air deposition from other continents.

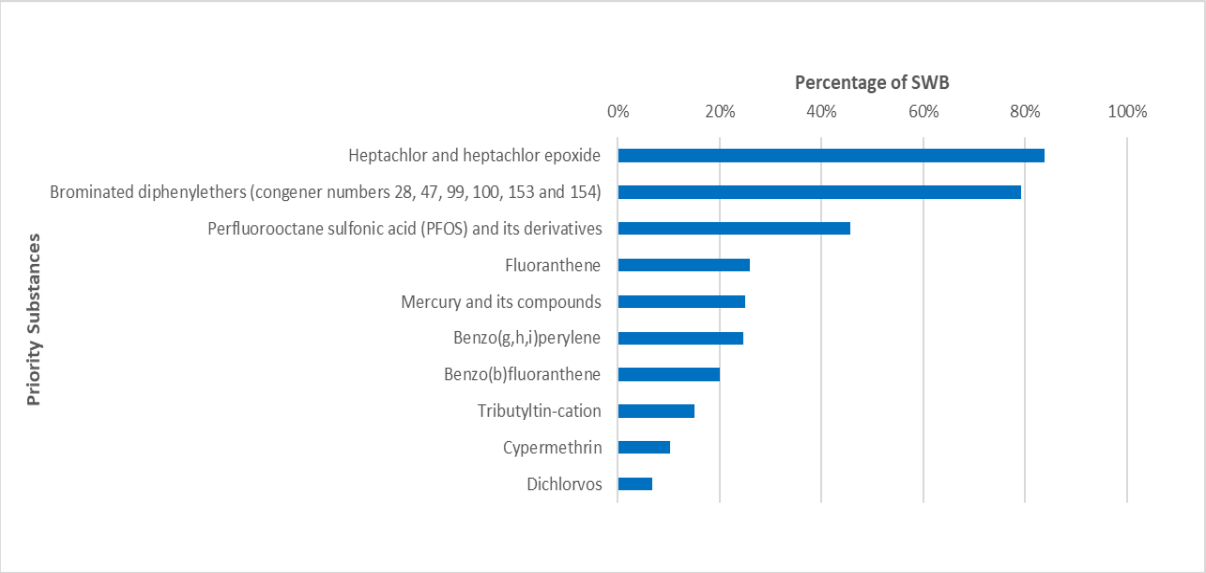
Against this background, it is not surprising that limited progress is expected by 2027. Estimates conclude that, around 80 % of surface water bodies will still fail to achieve good chemical status.

Figure 7: The top-10 Priority Substances causing failure to achieve good chemical status in surface water bodies in the Netherlands.



Source: Wise electronic reporting

Figure 8: The most problematic 10 substances taking also into account the 12 newly added priority substances in 2013[28].



Source: WISE electronic reporting

4.2 Groundwater Bodies: what is their chemical status

Monitoring

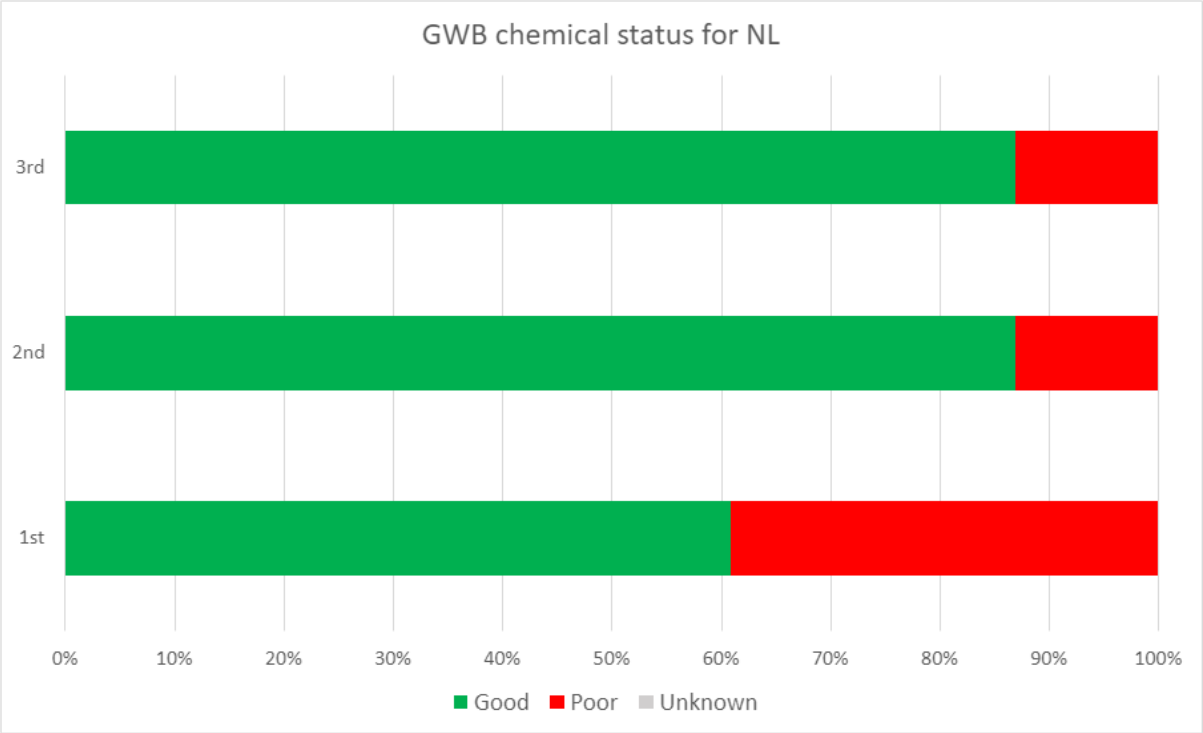
Most groundwater bodies have been monitored for chemical status but the number of surveillance and operational monitoring points have gone down from 1876 and 204 in the 2nd RBMPs to 1649 and 80 respectively in the 3rd RBMP. Overall, 88.3 % of the total groundwater body area is subject to monitoring for chemical status. In addition to the quality standards set out in Annex I of Directive 2006/118/EC, which must be complied with by all Member States, the Netherlands have also set national threshold values for a series of pollutants listed in Annex II to the GWD, for which Member States must consider setting threshold values, i.e. where these pollutants have been identified as causing risks to good chemical status of groundwater bodies. The Netherlands have also set national threshold values for pollutants not listed in Annex II to GWD, i.e. for pharmaceuticals.

As required under the GWD, the Netherlands have also carried out an assessment of environmentally significant sustained upward trends in pollutants or indicators of pollution in (groups of) GWBs identified as being at risk. Furthermore, since good groundwater chemical status also depends on the impact pollutants in groundwater may have on the status of associated surface waters (Groundwater Associated Aquatic Systems or GWAAEs) or on the status of terrestrial ecosystems which depend directly on groundwater (Groundwater Dependent Terrestrial Ecosystems or GWDTEs), these have been considered for the assessment of groundwater body chemical status, in accordance with the law. This implies also that specific attention has been paid to the objectives set for drinking water protected areas. Saline and other intrusions do not seem to be affecting chemical status.

[28] Directive 2013/39/EU amending Directive 2008/105/EC, added 12 new substances i.e. numbered 34 to 45 to the priority substances list. For the 3rd RBMP, Member States have only had the obligation to monitor them. Compliance with the Environmental Quality Standard values for these 12 new priority substances will be assessed in 2027.

Status assessment

Figure 9: Chemical status of groundwater bodies (GWBs) in the Netherlands in the 1st, 2nd and 3rd RBMPs



Source: WISE electronic reporting

Compared to surface waters, a much better situation can be seen for groundwater, partly because they are more shielded and less vulnerable to depositions of air pollutants. Confidence in classification is high. While a very good progress seems to transpire compared to the first cycle, there is no real progress or deterioration compared to the previous cycle: out of 23 groundwater bodies, 20 are currently in good chemical status, as in the 2nd RBMPs.

Like for surface waters, a small subset of compounds is causing the problem. Only four pollutants are causing failure to achieve good chemical status, all of them largely linked to agriculture: Nitrates and pesticides (water body NLGW0019), chloride (water body NLGW0015) and total phosphorous (water body NLGW0016). For the latter two groundwater bodies, a significant sustained upward trend in these substances was identified. Therefore, the status is unlikely to improve much by 2027. Although some measures are in place to address the issues, more time may be required for groundwater recovery. For that reason, the Netherlands have invoked the use of the exemption under Article 4(4) (natural conditions) of the WFD which allows Member State to continue to apply time related exemptions, even beyond 22/12/2027, if it can be demonstrated that all measures required to achieve good status are in place and being implemented, but the rate of recovery of the water body to good status may be delayed because of varying hydrogeological conditions.

4.3 What the Netherlands is doing to combat pollution from agriculture

As mentioned above the leaching of pollutants from agricultural land is at the heart of the pollution of groundwater and also to some extent of surface water.

There is some concern about the increased use of insecticides deltamethrin, esfenvalerate and lamda-cyhalothrin, which would, according to the Dutch Pesticide Risk Indicator[29], account for 90% of the pollution of surface waters. Even if only accounting for 0.1% of the total sales of pesticides, sales have increased with 65% in 2021 compared to 2010 (7% compared to 2020).

The RBMP refers to general binding rules to control diffuse pollution from nitrates, phosphates and pesticides, in accordance with Article 11(3)(h) WFD (basic measures).

Other measures concern a structural review of the manure policy which takes into account the national Water Quality Analysis (i.e., de Nationale Analyse Waterkwaliteit).

Also, the 7th action plan under the Nitrates Directive (2021[30]), is key for reducing nutrient pollution; it includes a mix of mandatory and voluntary measures and contains six pillars, including production plans to improve water quality and soil quality, additional support for hotspots where water quality is an issue, wider buffer strips where use of pesticides is not allowed (eg 100 to 230 metres in sandy areas), improved knowledge and communication, enforcement. The Netherlands obtained a derogation on 30 September 2022 under the Nitrates Directive (4 years, last derogation), allowing part of the farms to apply higher quantities of nitrogen (manure), subject to very strict conditions.

The Nitrogen Act sets out reduction objectives and forced scaling-down of certain agricultural activities are no longer excluded, albeit facing fierce opposition from the farming sector. As a result, two financial schemes for voluntary ending or adapting of livestock businesses have been opened mid-June 2023. However, the initial announcement of possible mandatory measures should the voluntary measures prove to be insufficient, has been withdrawn as a result of the July 2024 agreement of the new Dutch government.

The 2013 Delta Plan for Agricultural Management (associating farmers and water managers) aimed at providing innovative tailored solutions to tackle emissions from agriculture, in view of solving 80% of associated water quality issues by 2021 and 100% by 2027. 15,000 farmers take part in the 500 projects implemented or under implementation; the scheme is voluntary.

There is a gap assessment for nutrients. This allows, in line with the requirements under the WFD, to identify the needs, as well as progress towards the achievement of the objectives. Additional measures on wastewater collection and treatment will reduce the load of nitrogen by 4% and phosphorous by 3%, increasing the share of surface water bodies compliant with nutrient thresholds from the (current) 55% to 75% by 2027 (share in previous cycles was 52 % and 47 % respectively). If farmers would implement the voluntary measures under the Delta Plan, the nutrients load would be further reduced with 15% to 30%, and by 2027, around 85% of surface water bodies would be compliant with nutrient thresholds.

There is no similar gap assessment for pesticides. The RBMP merely notes that the trend analysis shows a reduction of the share of water bodies exceeding the quality standards for pesticides, even though the exceedance of some quality standards (for specific pesticides) remains almost constant. The Netherlands has less than 5% of agricultural land used for organic farming[31]. The Dutch new CAP Strategic Plan 2023-2027 reserves funds to support a maintenance plus an increase to 47.5% organic

[29] NMI and MIG/EICP | Pesticidemodels.eu
[30] 7e Nederlandse actieprogramma betreffende de Nitraatrichtlijn | Publicatie | Rijksoverheid.nl
[31] EUs organic farming area reaches 16,9 million hectares – Eurostat (europa.eu)

farming by 2027, as compared to 2022[32]. An increase in organic farming could however provide a boost to reducing nutrient losses and reducing fertilizer and pesticide use.

Overall, financing of agricultural measures is secured in all RBDs, through funding from the Common Agricultural Policy (CAP)[33], Structural and Cohesion Funds and national funds.

As part of the CAP, farmers receive €260 per hectare with an additional 'greening' payment of €115 per hectare for implementation of 'additional' climate and environment friendly practices[34]. The total greening premium funds in the 3rd RBMPs is set at €200 million, yet it is unclear how much of it actually contributes to improved water quality.

In addition, the former Dutch government has earmarked €5 billion for the implementation of basic measures to reduce nitrogen emissions for a 10-years period. An additional €811 million has been made available for the WFD (€670 million for the period 2022-2030, and €141 million euros for the period 2030-2035).

However, the newly formed Dutch government (July 2024) published an agreement[35] that is overruling the recently developed Dutch agricultural policy including funding of measures to address agricultural emissions. The agreement presupposes a thorough review of the Natura2000 areas to limit them to a few larger areas. This may have negative consequences for the water quality in the Netherlands and the North Sea coastal waters.

The Delta Plan for Agricultural Water Management has a total funding of €39 million up to 2027.

There is international co-ordination on identified Significant Water Management issues (SWMI), in particular as regards nutrient loads entering Dutch surface water bodies, including quantification of relative apportionment of loads in the three International River Commissions and the International Collaboration for the Eems. At all border crossings, Dutch ecologically underpinned thresholds for nitrogen and phosphorus are exceeded[36]. These upstream foreign sources of pollution create uncertainty for achieving the objectives.

4.4 What the Netherlands is doing to combat pollution from other sectors

Pollution in this context concerns nutrients, organic matter, sediment, saline discharges and chemicals (Priority Substances, river basin specific pollutants, groundwater pollutants and other physico-chemical parameters) arising from all sectors and sources apart from agriculture.

As pathways of pollution are very different, many different types of measures are needed.

The 3rd RBMP includes more details on the relationship between Key Type of Measures (KTMs) and pressures, associating each significant pressure with one or more KTM(s). All RBMPs report measures to eliminate/reduce pollution from Priority Substances and other substances.

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[32] At a glance: The Netherlands's CAP Strategic Plan (europa.eu) and Archive:Agricultural census in the Netherlands - Statistics Explained (europa.eu)

[33] In this respect, it may be useful to refer to the recent study on 'Mapping and Analysis of CAP Strategic Plans - Assessment of joint efforts for 2023-2027'

[34] There has been some controversy in the Netherlands over the fact that some water boards would put at disposal of farmers small parts of land/ditches, for those to count towards the 4% unfarmed land triggering additional subsidies

[35] Hoofdlijnenakkoord tussen de fracties van PVV, VVD, NSC en BBB | Publicatie | Kabinetsformatie (kabinetsformatie2023.nl)

[36] In 2010, upon recommendation from the Commission, the Netherlands has strengthened its nutrients standards for rivers and streams, whereas the Flanders region has not done so, creating additional transboundary issues

For human settlements, additional treatment of wastewater (including reducing emissions from stormwater) is expected to increase the share of water bodies complying with the nutrient thresholds from 55% (current share) to 75% in 2027 (as set out in the Nitrogen Act). Indeed, authorization regimes are in place for all discharges of urban wastewater in all RBDs, as well as registers of wastewater discharges (supplementary measure). There is a prohibition of all direct discharges to groundwater. For water bodies where standards are exceeded, additional treatment is planned (e.g. improve treatment and reduce release of untreated wastewater). Discharges from industrial wastewater are mainly addressed through permitting and application of 'best available techniques' under the Industrial Emissions Directive (2010/75/EC). There is a partnership in place between industries and several governmental organizations to limit industrial pollution ("Gebiedsgerichte Grondwater Aanpak"). The specific approach to 'Substances of Very High Concern' provides for a tool to search companies/processes to identify use of priority substances at source. It now also aims to include wastewater discharges to surface waters.

The Soil Protection Act and the Environmental Management Act also aim to protect groundwater, on the basis of maps pointing to large-scale soil contamination in particular close to vulnerable elements (eg groundwater-dependent surface waters, nature protected areas, drinking water).

The forecasts for 2027 are that at least 66% of surface water bodies will comply with the standards for the non-ubiquitous priority substances. For ubiquitous substances, the forecast is that 49% of surface water bodies will comply in 2027. For the new priority substances (i.e. those added by Directive 2013/39/EC, which can be subject to time related exemptions up to end 2039), the forecasts (with some uncertainty) are that 51% of the water bodies will comply in 2027.

There is a problem of (legacy) accumulation in terrestrial or aquatic soil/sediments, making it difficult to estimate by when compliance can be achieved. More research is needed on sources of pollution caused by several substances before additional measures can be formulated.

In conclusion, the PoMs leave unaddressed a significant gap to good status by 2027, in part due to the uncertainty around the reduction of upstream nutrient inflows and legacy pollution effects.

More details are required on how the gaps will be filled for each pressure or combination of pressures, based on a prioritization of measures, including cost-effectiveness analysis.

4.5 What is the Netherlands doing to combat significant pressures – overall assessment of the Programmes of Measures

Measures are in place and planned to address all significant pressures in both groundwater and surface water, with at least one KTM assigned to each pressure. All basic measures (under Article 11(3) WFD) are implemented in all RBDs.

The RBMP maps 96 national basic measures against 11 predefined KTMs. In addition, a total of 555 national supplementary measures have been mapped against 18 predefined KTMs and 3 nationally defined KTMs (the latter include awareness raising, reduction of nutrient pollution from multiple drivers and maintenance focused on improving water quality).

However, the proportion of supplementary measures being mandatory as opposed to voluntary is unclear. In addition, some national measures have not been associated to significant pressures and therefore may not have been put in operation yet. The latter concern water pricing for cost recovery of water services from households and from industry, drinking water protection measures (eg buffer zones) and measures to reduce sediment from soil erosion and surface run-off.

A cost-effectiveness analysis has been presented in the RBMP, but only at a generic level for categories of measures and not resulting in specific prioritisation of measures. The CEA uses quantitative data on volume of water, population development and production value in each RBD, to set out a baseline scenario for 2021-2027. There is an assessment of the cost recovery of water services.

A critical factor in the success of the PoM is the availability of budget/funding. The 3rd RBMP only includes costs to the public budget, which seems considerable as it is estimated at approximately € 1.5 billion of the total planned package of measures for the period 2021-2027, shared between the state (approximately € 0.4 billion), the provinces and water boards (approximately € 0.2 and € 0.9 billion respectively) and the municipalities (approximately € 45-50 million). There is no information on the prioritisation of measures, it appears that all measures are to be executed.

There is a clear overview of the state of implementation of measures set out in the 2nd RBMPs. Delays in implementation are explained by difficulties incurred with the buying of land required to fulfil the measures, or the need to first wait for completion of other development measures.

Point source pressures were in general well addressed (between 80 to 100% of measures implemented or on-going), with the exception of sanitation of soil/groundwater in Rhine RBD (67%) and of addressing sewage overflows in the Meuse RBD.

Diffuse source pressures were relatively well addressed with the exception of agricultural nitrate emissions in the Scheldt RBD (only 50%) and Ems RBD (only 25%), and disposal of polluted dredging material in the Rhine RBD (only 45%).

Hydromorphological pressures were not sufficiently addressed, with for instance in the Rhine RBD only 14% of measures to deepen water systems implemented, or only 12% of measures to widen/ renaturalise water systems in the Scheldt RBD.

Other, more (protected) area linked measures are very well implemented, including for instance 93% of measures to create specific living areas for fish.

But all in all, of the 1847 planned measures in the 2nd RBMPs, 516 measures have been finalised (March 2019) and 1255 measures are still being implemented. Therefore, implementation is for 95% on track.

For what concerns the 3rd RBMP, the Dutch Government has adopted the 'IMPULSE' programme[37] to further push for implementation of existing measures and include some additional (mainly voluntary) measures, also linking to spatial planning and stressing the important cross-sectoral character of water related issues.

For what concerns the mandatory measures, permitting and controls of point source and diffuse pollution, as well as of any activity causing hydromorphological impacts, is very important. The Netherlands seeks to improve the link between water quality objectives and permitting, control and enforcement systems which had become too decentralised and fragmented. There is also a more integrated cooperation between installations, permitting authorities and controlling and enforcement authorities and appropriate training for permitting authorities now in place. However, permits may be granted for an unlimited period of time and no periodic review is foreseen as required under the WFD.

Additional measures are in place to address pressures from specific pollutants causing at least 5% of water bodies to be in bad status. For instance, dental amalgam is no longer used, mercury is being taken out of wastewater from waste incineration. Cadmium and nickel are causing water quality

[37] Waterbeleid | Tweede Kamer der Staten-Generaal

problems, in particular in the Meuse RBD (cadmium in manure from cattle and pigs and broilers has been seriously reduced since 2008, by reduction of cadmium in phosphate fertilisers.

The use of PAHs coatings is forbidden on inland ships and PAH's in water will also be reduced by new rules for wood burning stoves, new motors in vehicles.

The production of PFOS has stopped in 2002 already, and PFOA is prohibited in consumer products since 2020. This will contribute to their reduced emissions to water. The Netherlands is in favour of a ban on use of PFAS (for as many applications as possible) in the context of REACH Regulation. In relation to ammonium, there are measures to establish reduced ammonia emission barns, injecting manure in soil and transport outside the Netherlands.

For pressures from river basin specific pollutants such as arsenic, boron, cobalt, selenium, uranium and silver, more insight is needed into the sources before additional measures can be formulated.

For pesticides there is a strategic plan including recommendations for more sustainable use; however, measures have not proven effective since harmful pesticides are often replaced by other, not less harmful pesticides. Some regional authorities set additional requirements. The province Zuid-Holland for instance has forbidden the use of pesticides in its natura protected areas.

Nutrients leaching from agriculture, wastewater treatment and flowing in from upstream transboundary sources remain problematic. The deposition of ammonia as a result of transboundary air pollution is not taken into consideration to address problematic nutrients loads. There still is a manure excess which prevents compliance with the Nitrates and Water Framework Directives. The 7th Nitrates action programme focusses on hotspots and mixes mandatory and facilitating measures and nation-wide as well as area specific measures. Considering the wide variety in agricultural sectors, the 'Deltaplan Agrarisch Waterbeheer[38]' focuses on mainly voluntary emission reductions, through cooperation with the relevant sectors.

In conclusion, despite the adoption of the 'IMPULSE' programme, additional measures may not be sufficiently effective, as much seems left to voluntary uptake, including agreements with various sectors. There don't seem any binding requirements on policy areas other than water management which are necessary to achieve good status. This situation in which actors have too much discretion to address WFD issues, may worsen with the entry into force of the new Environment and Planning Act[39], as a number of activities impacting water systems will no longer need to be licensed. It is worthwhile noting that the national Parliament has endorsed a motion calling on the government to consider a lowering of objectives in 2027 for those water bodies for which it would be unrealistic to comply, because of the negative economic and social consequences.

Table 4: Reported obstacles to progress in achieving PoM objectives between the 2nd and 3rd RBMPs

Obstacle	Number of RBDs
Governance	0
Delays	4
Lack of Finance	4
Lack of Mechanism	0
Lack of Measures	0

[38] Mededeling | Deltaplan Agrarisch Waterbeheer
[39] General information on Environment and Planning Laws | Informatiepunt Leefomgeving (iplo.nl)

Obstacle	Number of RBDs
Measures not cost effective	4
Extreme Events	3 (excluding Rhine)
Other: 1. Land acquisition 2. Drought 3. Programmatic approaches to nitrogen 4. PFAS policy	4 (all 4 are in all RBDs)

5. Exemptions and economics

5.1 To what extent are exemptions applied in the Netherlands

According to the WFD, where the objective of good status is not yet achieved, exemptions can be applied in accordance with Article 4, paragraphs 4, 5, 6 and 7. A significant number of exemptions are still applied, under the different paragraphs (categories of exemptions) with the exception of Article 4(5).

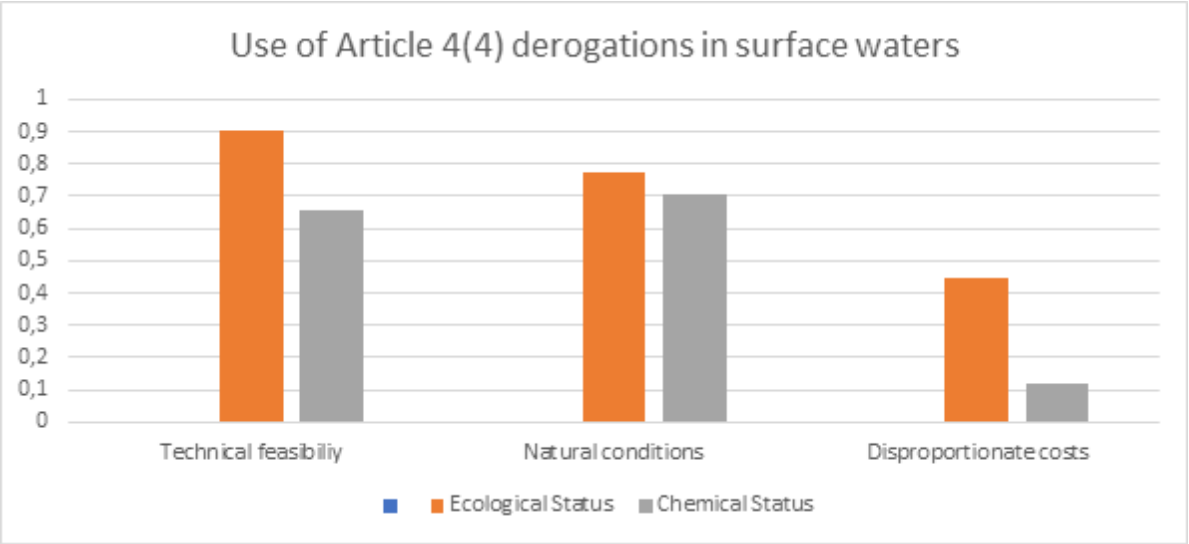
There are factsheets available for each water body, which describe the water body, its objectives, its current status, pressures and impacts, measures and provide a summary of the exemptions and related justifications[40]. This is a good practice and in line with the WFD requirement to specifically set out and explain the reasons for exemptions in the RBMPs.

Article 4(4)-time related exemptions apply on grounds of technical feasibility, disproportionate costs or natural conditions.

Their number has increased for chemical status in surface water bodies, since the number of surface water bodies not achieving good chemical status has increased from 61% to 91%, and they apply to most surface water bodies due to ubiquitous persistent bio-accumulative and toxic substances which are difficult to address. The reasons for these exemptions are provided at the water body level and for each water body a factsheet with detailed justifications for each exemption has been developed. Most exemptions for surface water bodies were justified on grounds of technical feasibility, followed by natural conditions and disproportionate costs. More than one exemption ground argument is usually applied to the same water body.

[40] KRW-factsheets | Het Waterkwaliteitsportaal

Figure 10: Use of Article 4(4) exemptions for surface water bodies



For groundwater bodies, 1 out of 23 is exempted for quantitative status and 3 out of 23 for chemical status. Just like for surface water, more than one exemption applies per water body. Most exemptions were justified on grounds of technical feasibility (13% for chemical status and 4,3% for quantitative status), followed by natural conditions and disproportionate costs (4,3% for chemical and quantitative status, for both justification grounds).

The main reasons argued under 'technical feasibility' were:

- the need for further research to determine the cause of failure,
- uncertainty of availability of land to carry out the measures and time required to go through procedures to acquire it
- transboundary pollution and
- hydromorphological conditions.

The main reasons provided under 'natural conditions' were

- the long time needed for hydromorphology, substances and biology to adapt to the new conditions with some measures requiring 10 years or even longer to take effect
- residual diffuse pollution from leaching pollutants since long present in the environment (e.g. sediments) even after reduction of the source of pollution, and
- the influence of non-native species that can have negative effect on fish stocks, native plants.

Reasons provided under 'disproportionate costs' are based on cost-benefit assessments, also including affordability and social and sectoral impacts. Costs and benefits are considered at the level of a management area, rather than at a water body scale. For some water bodies the costs were put in perspective of an excessive burden on the budget, a disproportionate increase in local taxes or levies or the necessary land not being available at market prices due to an increased demand. To alleviate the cost, infrastructure related measures are aligned with asset replacement periods (i.e. at end of lifetime). Adaptation of urban wastewater treatment plants to treat new substances is planned to take place in phases, to allow coordination with innovations generating energy, recovering raw materials or enabling water reuse. National political considerations also play a role, in particular for measures to address manure whilst ensuring a viable agricultural sector.

Article 4(5) exemptions (lowered objectives)

It is positively noted that they have not been applied at all, as in previous cycles.

Article 4(6) exemptions (temporary deterioration)

Regrettably their number has seriously increased from 18 in the 2nd RBMPs to 87 in the 3rd RBMPs, affecting (only) surface water bodies in two RBDs (86 in the Rhine RBD and one in the Meuse RBD). Most exemptions were justified by reference to natural causes (prolonged dry summers in 2018, 2019 and 2020), two because of accidents and four because of force majeure. Factsheets explain, for each affected water body, quality elements affected (e.g. phytoplankton, specific pollutants, physico-chemical parameters), reasons, planned measures and their anticipated impact. In some cases (30 water bodies), the justification is not appropriate because it refers to natural variations/monitoring effects (an effect of methodology/monitoring). In 55 water bodies, the reasons for deterioration of physico-chemical quality elements were explained by drought/peak discharges. Where drought/showers are mentioned as grounds, in most cases this concerns an effect on physico-chemical parameters; in only a few cases, biological quality elements are also affected. According to the Netherlands, this should therefore mainly be seen as an early warning, rather than as an actual decline.

Article 4(7) exemptions (exemption to the obligation of non-deterioration, in case of new modifications or sustainable human development activities)

An Article 4(7) derogation has only been applied to one surface water body (compared to 2 in the 2nd RBMPs). There is an explanation provided in the fact sheet. In the Netherlands, deterioration is assessed on a time scale of the six years planning period rather than for project-specific/shorter timelines. A 'Policy Rule'[41] sets out guidance for project-specific evaluations. The objective is to avoid deterioration or prevention of achievement of good status/potential by means of mitigation measures. There is a general exemption for projects considered not ecologically relevant. Article 4(7) WFD does not however set such a 'de minimis' rule for assessing impacts. In addition, the 'Policy Rule' does not include guidance for assessing cumulative impacts, overriding public interest or better environmental alternatives, as required by the WFD.

The Netherlands have also raised a problem of 'moving' around sediments as a result of dredging activities which would not be in the scope of Art 4(7) (and therefore could not be justified thereunder) but might in some cases result in deterioration of chemical status of a water body, even if there is no effective additional input of pollutants into the environment.

5.2 Use of economic analysis and water pricing – cost recovery

Extent of reporting of the (summary) of the underlying economic analysis (Annex III WFD)

The Netherlands report that the economic analysis from the 2nd RBMPs has been updated with data from after 2015, whereas the methodology has remained the same. However, the summary in the 3rd RBMPs seems too concise to verify whether gross modo the required analysis elements listed in WFD Annex III have been adequately covered in the update, including investment forecasts beyond 2027, the end of the programming period. It remains therefore unclear whether the analysis has made use of up-to-date long-term water supply scenarios from the national climate adaptation strategy (including those underlying the Delta Program). The focus in the RBMP report appears on the trends in the main drivers of water demand, but without a quantitative confrontation of long-term supply and

[41] Staatscourant 2022, 6470 | Overheid.nl > Officiële bekendmakingen (officielebekendmakingen.nl)

demand, the economic analysis does not sufficiently explore when and where bottlenecks may occur beyond 2027.

A supporting document reports on the costing of measures and provides a so-called "quick scan cost-benefit analysis" which has informed the selection of measures into the Programme of Measures. It is however not explained whether this relates to the prescribed use of cost-effectiveness analysis.

Cost recovery and adequate contribution of water use sectors

The mechanism of cost recovery is laid down in a national law (Drinking Water Act, Municipalities Act, Water Boards Act, Water Act). […].

The RBMPs reports that due to this solid anchoring of the cost recovery mechanism in national legislation, the defined broad water services (drinking water supply; sanitation services; wastewater management; groundwater management and regional water quantity management) achieve (nearly) full cost recovery, similar as in the 2nd RBMPs. This implies that there are no significant subsidies paid for the delivery of water services, and that it is not necessary to invoke any of the mitigation factors to cost recovery as listed in article 9 of the WFD.

Table 6.d of the RBMP provides data on the costs of water services and other costs related to water quality management, as well as how these are financed. Figures are provided at the level of water service, without a differentiation across water use sectors. On the other hand, WISE reporting shows that the broad user sectors - households, industry and agriculture - contribute to the cost recovery of water services. However, the RBMP lacks a clear account on the adequacy of these sectorial contributions.

Water prices and the price incentives to use water efficiently

The RBMPs include a clear description of how the costs are recovered for the individual water services through pricing measures:

- Drinking water supply to households is subject to an average price of 1,35 EUR per cubic meter, excluding all taxes;
- Supply of freshwater to the agricultural sector is sometimes charged by Water Boards but no further details are given on what the charges are or when this applies (eg in areas with brackish water);
- Collection/ disposal of rainwater/wastewater is subject to a sewerage levy by municipalities;
- Wastewater treatment is subject to a treatment levy for discharges into sewers and treatment plants and pollution levy for discharges into surface waters; amount based on number of pollution units;
- A groundwater levy is applied for large-scale withdrawals by water companies and industry, charged by Provinces; however no levy is applied for smaller withdrawals for domestic use or agricultural applications; not considered cost-effective (no metering of these uses);
- A regional water system management levy is charged by Water Boards.

However, the RBMPs do not give an explicit account on the adequacy of the price incentives to use water efficiently. They do not give details on the effect of these pricing policies on water uses (including reducing and avoiding pollution), and only very limited information on the structure of the tariffs and levies. Also, the environmental and resources cost (ERCs) estimates, i.e. the value of water for alternative users including its ecological value for ecosystems, are not taken on board.

However, triggered by the periods of drought in recent years, the Ministry of Infrastructure and Water Management has recently announced a new policy called 'water en bodem sturend'[42]. As part of this new policy, the Ministry is now again explicitly looking at pricing as a potential instrument to reduce overall water consumption. The results will be presented in the next plans.

Polluter Pays Principle

There does not seem to be a comprehensive account on how the Polluter Pays Principle is applied. This may however be considered as being implicitly covered by the RBMP discussion of the price instruments (see above).

Funding

Finally, Chapter 6.6 of the RBMP lists public funds available under various funding mechanisms, allowing for funding of measures to improve water quantity and quality: i.e. Horizon 2020 (water-related research programmes), Structural and Cohesion Funds (ERDPF, to support activities, especially along borders that contribute to WFD goals) and LIFE (projects related to nature, biodiversity, circular economy and quality of life, climate mitigation and adaptation, energy transition).

6. WFD recommendations

The Netherlands should urgently address problems to improve the hydromorphology of their waters (river dynamics, bank characteristics, etc.), to reduce concentrations of nutrients and chemicals in surface water, as well as, to a limited extent, in groundwater, and to prevent water shortages during dry periods.

The Netherlands should therefore:

1. Further raise the level of ambition and accelerate action to reduce the compliance gap as much as possible by 2027. This implies:
   a) the development of more ambitious Programmes of Measures including additional measures and consider making these mandatory;
   b) clarifying tasks and responsibilities of authorities in charge of water management and ensure better coordination between the different administrative levels and authorities in charge of implementing the Water Framework Directive and other related policies, including Marine and Nitrates Directives;
   c) Ensuring full compliance with WFD provisions related to mandatory periodic review of permits/controls for all relevant activities impacting water bodies (including abstraction, impoundment, discharges).
2. Identify and put in place, as appropriate, additional measures to reduce existing persistent environmental challenges (pressures) preventing the achievement of good status based on robust gap analyses. This implies, inter alia:
   a) Stepping up action to drastically reduce nutrient pollution (the nitrogen surplus being four times higher than the EU average, with 50% coming from agriculture), by assessing the effectiveness of existing measures and implementing additional measures as necessary to achieve the objectives of the WFD, including mandatory

[42] Kabinet maakt water en bodem sturend bij ruimtelijke keuzes | Nieuwsbericht | Rijksoverheid.nl

measures if voluntary measures appear insufficient and through securing greater synergies between the WFD goals and other policies and instruments (CAP, MSFD and NiD). This has also been highlighted in the recently adopted Semester report for the Netherlands, which calls for more efforts to make agriculture more sustainable, by cutting the use of chemical pesticides and inorganic fertilisers;

b) Increasing funding for sustainable water management (Semester report identified a gap of €1.2 billion);

c) Continuing to ensure that, for chemical pollution, the Programmes of Measures include a sufficient number of mandatory measures to achieve compliance;

d) Stepping up research activities to identify sources of pollution by several substances, so as to enable identification of the required additional measures;

e) Ensuring that permits of all UWWTPs and other industrial installations discharging into surface waters are reviewed, and, where so required, updated prior to the end of the third RBMP cycle, so as to enable the identification and implementation of necessary measures to reduce pollution;

f) Enhancing efforts on nature-based solutions including re-naturalisation and ecosystem restoration which will reduce the hydromorphological pressures on water bodies;

g) Providing more clarity on the establishment and use of ecological flows, that is the level of water that must be left in the water body for the ecosystem to properly function;

h) Review the application of the Polluter Pays Principle as regards both the funding of the pollution abatement measures in the Programme of Measures and the cost recovery of water services, in view of ensuring an adequate contribution of those water uses that exert an upward cost pressure on water supply and water treatment.

3. Where the objectives of the Directive for a specific water body cannot be met and exemptions are invoked, this should be done in line with ECJ jurisprudence on the restrictive interpretation of exemptions, providing a detailed justification at the level of the water body and it should be ensured that their application is regularly reviewed. This implies, for the Netherlands:

   a) Recognising that the possibilities for time extensions (Article 4 (4)) are extremely limited and will no longer be allowed after 2027 (except if duly justified for natural conditions) and taking action appropriately;

   b) Not applying a ‘de minimis’ rule in respect of new projects potentially deteriorating status in accordance with Article 4(7) WFD and provide more detailed justifications on those exemptions for new projects, including new dams and water transfers, including by detailing cumulative effects, the assessment of better environmental options, and the measures taken to mitigate the adverse impacts of new developments.

4. As regards monitoring, assessment, data management and reporting, the Netherlands should:

a) further strengthen monitoring systems to close gaps both in terms of geographic coverage and parameters covered, in particular monitoring of hydromorphological quality elements in all water bodies and of general physico-chemical quality elements and other aquatic flora in all coastal water bodies;

b) Ensure monitoring for chemical status in all surface water bodies in which priority substances are discharged and ensure that monitoring in biota for status assessment takes place annually, unless longer intervals can be justified.

SECTION B:

FLOODS DIRECTIVE

7. Flood risk management under floods directive (FD)

The Directive requires each Member State (MS) to scan its territory for flood risks, assess the potential adverse consequences of future floods for human health, the environment, cultural heritage and economic activity, identify the significant risks, map the flood extent and the potential adverse consequences, and take measures to reduce the flood risk. These activities are reflected in (a) the preliminary flood risk assessments, or PFRAs (including the identification of areas of potential significant flood risk, or APSFRs), (b) the preparation of flood hazard and risk maps, or FHRMs, and (c) the establishment of flood risk management plans, or FRMPs. The preliminary assessments, mapping and planning for flood risk are repeated in six-yearly cycles.

There are four Units of Management (UoMs) in the Netherlands, which are the same as the Water Framework Directive's River Basin Districts (RBD). Fluvial, sea water and artificial water bearing infrastructure are considered as potentially significant sources of flooding in the Netherlands. The Netherlands has designated 14 Areas of Potential Significant Flood Risk (APSFRs)[43]. The Netherlands considered the IPCC scenarios for climate change impacts on flood risks at the time of the second preliminary flood risk assessment. The outcomes of several projects that took into consideration these IPCC scenarios have been summarized in the 'Deltaprogramma', which is the national adaptation strategy. The Deltaprogramma includes scenarios on climate change, and these are used to identify and detect flood risks.

7.1 Flood hazard and risk maps

The Netherlands are using online map portals for their FHRMs. FHRMs were prepared at the national level and show the whole country covering all four UoMs. All APSFRs are covered by the FHRM. Maps for floods with low probability (1/1 000 years), with medium probability (1/100 years) and with high probability (1/10 years) are provided, with legends and explanation of features. Extremely low probability (1/10 000 years) is also considered, on a separate map. The maps clearly show flood extent and water depth, using six different colours for different depths. They also clearly show the number of inhabitants and type of economic activity, again distinguishing between six ranges of inhabitants and six types of activities. Installations covered by the Industrial Emissions Directive (IED) are included, distinguishing between three different sizes but the meaning of those is not clear. Potentially affected protected areas identified in Annex IV(1)(i), (iii) and (v) to Directive 2000/60/EC are shown in the FHRMs as "vulnerable areas".

In terms of changes of contextual information since the 1st FHRMs (i.e. the way in which information about the maps is conveyed to the public), these include: pl (a) for the 2nd FHRMs, the Netherlands now also reported a manual explaining the method of development of the maps, which is available to the public; (b) the 2nd FHRMS provide information on limitations of the maps and assessments of uncertainty for the low-probability scenario and (c) the 1st FHRMs only identified a single map portal containing both flood hazard and risk maps; whereas for the 2nd FHRMs, two portals were identified, one of which only contains flood risk maps.

In terms of actual information provided on the maps, there are several similarities and differences since the 1st FHRMs: In the 1st FHRMs, the Netherlands presented seawater and fluvial flood hazards

[43] The Netherlands did not designate APSFRs for the 1st PFRA, basing itself on the possibility provided under Article 13(1)(b) of the Floods Directive.

for all four UoMs. However, these were shown together on the map in an indistinguishable manner. The latter is still the case in the 2nd FHRMs. Indeed, despite the Netherlands having a coastline, neither the 1st nor the 2nd FHRMs include separate information on sea water flooding. The 1st FHRMs did not cover pluvial floods, groundwater floods, floods due to artificial water bearing infrastructure sources. On the other hand, the 2nd FHRMs (Risicokaart) now also show different national "types" of floods, based on a classification of the main versus the regional water system and whether areas are protected or not by flood defences. They also consider floods from artificial water bearing infrastructure, which were not considered in the 1st FRHMs.

In the 1st FHRMs it was possible to choose which UoM is shown, which is no longer the case in the 2nd FHRMs. Also, in the previous FHRMs the Netherlands reported potentially affected inhabitants per UoM rather than per APSFR, whereas in the 2nd FHRMs no information is reported per UoM. While the 1st FHRMs showed scenarios for three flood probabilities, the 2nd FHRMs show four scenarios, now also including a very low probability (extreme event) scenario. In both 1st and 2nd FHRMs, the maps show water depths but not water levels, although in the 1st FHRMs flow velocities were provided, which is no longer the case in the 2nd FHRMs. In both 1st and 2nd FHRMs, the maps show potential adverse consequences, specifically, consequences for: an indicative number of inhabitants, areas of economic activity and use, facilities containing potentially dangerous substances, properties, installations related to accidental pollution and locations of WFD protected areas. There is no mention however of cultural heritage. Unlike in the 1st FHRMs, the 2nd FHRMs now also show drinking water abstraction areas, Natura 2000 sites or bathing water sites, though only on the bij12 maps.

In terms of changes in **methodologies used to prepare flood hazard maps** since the 1st FHRMs, in the 1st FHRMs, only three probabilities were considered (1/10, 1/100 and 1/1 000), whereas in the 2nd FHRMs four were considered (also 1/10 000 years was considered for the development of the maps). In the 1st FHRMs, floods with return periods of 1/100 – 1/300 years were depicted on the medium probability hazard map, floods with return periods of 1/500 – 1/10 000 years were depicted on the low probability hazard map, and on the maps for high probability hazard (approximately 1/10 years return period), floods in unprotected areas are shown. The Netherlands reported in the 1st FHRM that to prepare the flood risk and hazard maps, scenarios were developed that assumed hypothetical failure of the flood defences. The maps showed what flood risks and hazards are prevented by maintaining flood defences according to the given safety standards. This methodology was not followed in the 2nd FHRMs. Whereas in the 1st FHRMs flood defences were considered as providing a level of protection based on the normative standards (given above), in the 2nd FHRMs they were assumed as absent and depicted on a separate layer on the map.

In terms of changes in **methodologies used to prepare flood risk maps** since the 1st FHRMs, there is only one change, in relation to the assessment of the risk to human health: in the 1st FHRMs, this risk was, for each UoM, determined based on the number of inhabitants per 100m2 (shown for six ranges, with the different categories indicated by a different shading). There were no details on how this was calculated. In the 2nd FHRMs, it is specified that the number of inhabitants is based on Centraal Bureau voor de Statistiek statistics of the number of inhabitants per hectare.

As regards the consideration of climate change effects in the preparation of flood hazard and risk maps, reference is made to section 3.7 on 'adaptation to climate change'.

7.2 Flood risk management plan

The 2nd FRMP (one plan integrating and updating the previous four FRMPs of the first cycle) can be downloaded from the website of an intergovernmental programme providing information about the environment and environmental legislation and is also available on the national government's main website[44]. The results of the FHRMs were used as the basis for the FRMP's new objectives and measures.

Objectives

The Netherlands has set general objectives, and specific objectives for four types of flood risk areas (which are carried over from the FHRMs). The objectives aim to reduce flooding consequences, including limiting damage in areas along the main water system which are not protected by flood defences and limiting the risk of death in areas protected by flood defences. The objectives also aim to reduce the likelihood of flooding, by referring to spatial planning and to crisis management. Notably, one objective calls for the Netherlands to be 'climate-proof and water-robust', which implies that the Netherlands is aware of its vulnerability to floods and has implemented measures to minimise vulnerability. The FRMP refers to the Delta Plan on Spatial Adaptation, which addresses spatial development in general and vital and vulnerable infrastructure in particular. While the objectives are expected to reduce adverse consequences on economic activity, environment and cultural heritage, these elements are not specifically addressed.

Measures

The FRMP lists 34 measures, indicating for each measure whether it is 'very high' or 'high' priority. In EIONET, 119 measures are reported, 52 of which are marked as 'very high priority' (44 %) and the remaining 67 marked as 'high priority' (56 %). While half of the preparedness measures are very high priority (32 measures, 51 % of the 63 preparedness measures), only about one-third of the prevention and protection measures are very high priority.

The FRMP does not indicate how the progress of the measures will be monitored, though the Netherlands did report the progress of its measures.

The FRMP does not provide information on the cost of measures, nor was this information reported. The FRMP does not refer to the use of CBA or other economic analysis of its measures, although the law requires the FRMP to take account of costs and benefits. The FRMP states that the funding of measures is primarily at national level. The Delta Programme, a number of whose measures target FRM, arranges its financing through the national Delta Fund. The use of cost-benefit analysis or related methods is not mentioned in the FRMP.

The FRMP includes summary flood hazard and risk maps, which were used as a basis for its objectives and measures. Flood conveyance is considered an important feature, just like natural water retention which is referred to in both FRMP measures and Delta Programme measures. As a rule, areas not protected by flood defences are considered potential areas to absorb flood waters. New measures should be assessed with respect to WFD objectives.

Prevention (spatial/land-use measures), protection and preparedness measures are in place for all UoMs. Preparedness measures include forecasts and early warning systems. The FRMP includes measures that mention nature-based solutions. There is no indication however that ports and (inland)

[44] overstromingsrisicobeheerplan-2022 (5).pdf

navigation have been specifically considered. On the other hand, in line with the first general objective addressing climate change, the FRMP contains extensive information on the likely impact of climate change.

Progress

In the 2nd FRMP, the area-specific objectives are tailored to the different types of flood areas and provide specific and in some cases measurable elements. In the 1st FRMPs the Netherlands did not indicate whether a baseline is used for monitoring progress, which is also the case for the second one. The 2nd FRMP and its objectives are clearly linked to a range of other national policy and planning documents, as well as to sub-national activities. However, the FRMP provides only an overview of these links and of the process for setting its objectives without describing the process in more detail. The general objectives of the 2nd FRMP provide a long-term vision for flood risk management.

In the 1st FRMPs the objectives were not specific or measurable. The 2nd FRMP provides an overview of the achievement of the objectives in the 1st FRMPs, and reports on implementation of the measures related to those objectives. Progress is reported according to three categories: ongoing construction, ongoing (recurrent e.g. maintenance works), and in preparation. No completed measures or abandoned/interrupted measures were reported, although the FRMP mentions those. The great majority of measures are reported as ongoing (recurrent e.g. maintenance works). Just over half are for preparedness. The review of the measures indicates that essentially all are implemented, including non-structural ones. For a measure to strengthen primary flood defences, the plan briefly notes that defences have been reinforced, rivers have been widened and programmes such as 'Space for the River' were completed. In addition, 797 km of regional defences were strengthened in the period from the introduction of the 1st FRMPs to 2019. Nonetheless, for most objectives and measures from the 1st FRMPs, the 2nd FRMP refers to the need for ongoing attention. Many of the measures in the 1st FRMPs continue in the 2nd FRMP, and this is coherent with the reporting to EIONET that most measures are ongoing. The 2nd FRMP indicates that its objectives and measures will be monitored to measure progress.

Governance

The FRMP highlights strong cooperation with other Member States, within the context of international river basin commissions and bilateral working groups. The FRMP and the Netherlands's reporting to EIONET emphasises strong coordination with the WFD.

The FRMP notes active involvement of stakeholders, though primarily through the National Water Plan (NWP), not directly for the FRMP itself. The FRMP[45] describes how the public was consulted for the NWP, to which the FRMP is annexed. The FRMP reports that the draft NWP was presented for public consultation for six months. This consultation covered the NWP's annexes, including the FRMP. Participants in the stakeholder consultation sessions for the NWP, including a session held with public authorities as well as thematic sessions with civil society and interest groups, received a report on the session, together with feedback on whether and how their input was incorporated.

Consideration of climate change

As regards the consideration of climate change effects in the preparation of flood risk management plans, reference is made to section 3.7 on 'adaptation to climate change'.

Progress identified in the second FRMPs

[45] FRMP, p. 54.

The general objectives of the 2nd FRMP provide a long-term vision for flood risk management. Contrary to the 1st FRMP, in the 2nd FRMP, the area-specific objectives are tailored to the different types of flood areas and provide specific and in some cases measurable elements. Moreover, the 2nd FRMP and its objectives are clearly linked to a range of other national policy and planning documents, as well as to sub-national activities. The 2nd FRMP does refer to the national climate strategy, it mentions pluvial flooding and indicates that this source of flooding is expected to increase in importance due to climate impacts.

8. FD recommendations

Based on the assessment of the reported FHRMs and FRMPs, the Netherlands should consider the following recommendations to enhance flood risk management:

- Consider pluvial floods in the FHRM;
- Consolidate in one website all information available on the subject or provide clear links to relevant sources of information;
- Explicitly consider cultural heritage in the FHRM;
- Provide detail in the FRMP on how the FHRM was used in the choice of objectives and measures;
- The relationship between the objectives set out in the FRMP and in other documents should be clearer. An assessment of the progress made towards the achievement of the objectives should be included in the FRMP.
- Include in the FRMP the methods used to monitor the progress of measure;.
- Consider insurance as a potential measure for adaptation to climate change;
- Incorporate in the FRMPs, where relevant, a CBA for the prioritisation of measures that lend themselves to it and provide a clear description of the methodology used;
- Provide details in the FRMP on public consultation comments received and how they were taken into account;
- Consider an SEA for the FRMP, or if the FRMP is part of another plan that underwent an SEA, how that SEA is related to the FRMP;
- Consider in the FHRM, where appropriate, flow velocity or relevant water flow and the in the FRMP flood conveyance routes, as these are relevant to emergency response.