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REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

on the implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2012–2015

{SWD(2018) 246 final}

1. INTRODUCTION

Council Directive 91/676/EEC (the Nitrates Directive) aims to reduce water pollution caused by nitrates from agricultural sources and to prevent further such pollution. The Nitrates Directive forms an integral part of the Water Framework Directive (WFD) and is one of the key instruments in the protection of waters against agricultural pressures. The Nitrates Directive sets a number of steps to be fulfilled by Member States:

- Water monitoring of all water body types with regard to nitrate concentrations and trophic status;
- Identification of waters that are polluted or at risk of pollution, on the basis of the criteria defined in Annex I to the Directive;
- Designation of nitrate vulnerable zones, which are areas that drain into waters and which contribute to pollution;
- Establishment of codes of good agricultural practices, implemented on a voluntary basis throughout the Member State territory;
- Establishment of action programmes, which include a set of measures to prevent and reduce water pollution by nitrates and are implemented on an obligatory basis within designated nitrates vulnerable zones or throughout the entire national territory;
- Review and possible revision of the designation of nitrate vulnerable zones and of action programmes at least every four years; and
- Submission to the Commission of a progress report on the implementation of the Directive every four years with information on codes of good agricultural practice, nitrate vulnerable zones, water monitoring results, relevant aspects of action programmes.

This is the third time that 27 Member States have submitted a report under Article 10 of the Nitrates Directive, and the first time for Croatia. A comparison with previous reporting periods is now possible for 27 Member States. The submission of the reports and the accompanying water quality data by the 28 Member States were due in June 2016. However, only 12 Member States respected this deadline[1] and for some of them relevant information was still missing and was reported later on. For 19 Member States missing or corrected information was submitted only in 2017[2]. The complete set of information was only available to the Commission in October 2017.

This report, mainly based on the information submitted by Member States for the period 2012–2015, is accompanied by a Staff Working Document **(**SWD(2018)246**)** which includes maps and tables on indicators of nutrient pressures from agricultural sources, water quality and designated nitrate vulnerable zones, both at EU level and at Member State level.

With the publication of this report, the Commission fulfils its obligations under Article 11. The information collected for this report contributed to the recently

[1] Belgium, Croatia, Estonia, Finland, Ireland, Italy, Lithuania, the Netherlands, Portugal, Slovakia, Slovenia and Sweden

[2] Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Malta, the Netherlands, Portugal, Romania, Spain, Sweden and United Kingdom.

proposed revision of the Drinking Water Directive[3]. Indeed agricultural practices like fertilisation influence drinking water quality. Excess of nitrates in drinking waters can have health impacts i.e. methemoglobinemia, which prevents the normal transport of oxygen by the blood to the tissues causing cyanosis and, at higher concentrations, asphyxia which can be lethal for babies. Thus the trends observed in the implementation of the Nitrates Directive may have a bearing on the supply of clean drinking water for all citizens.

The Nitrates Directive contributes to addressing nitrogen and phosphorus flows to the biosphere and oceans that have been identified by the scientific community as one of the nine planetary boundaries. Furthermore, nutrients flows together with biodiversity loss are two planetary boundaries that have been surpassed. Moreover, the Directive also contributes to the achievement of the Sustainable Development Goals in the EU by helping reducing negative environmental impacts associated with food production (SDG 2), by supporting improved water quality (SDG 6) and by reducing pollution affecting freshwater and ecosystems[4] (SDG 14 and SDG 15).

2. EVOLUTION OF PRESSURES FROM AGRICULTURE

Agriculture, which occupies nearly half of the EU territory, provides multiple benefits to society. However, some farming activities cause pressures on water bodies, impacting on the health of vital water ecosystems.

This section summarises the information reported by the Member States on the agricultural pressures at the origin of water pollution by nitrates and eutrophication. It needs to be noted that the information reported by the Member States has been complemented with data originating from Eurostat as they are more easily comparable at EU level[5].

Livestock population

Large numbers of animals concentrated locally pose high risks to the environment when manure production is out of balance with land availability and crop needs. This imbalance creates a surplus of nutrients, a large amount of which is sooner or later lost to water and air, if not exported out of the region, sometimes leading to additional pressures in receiving areas.

The average livestock density[6] in EU28 was 0.73 livestock units (LU) per ha utilized agricultural area (UAA) in 2013. The higher densities were found in the Netherlands (3.57), Malta (2.99) and Belgium (2.68) while the lowest were located in Bulgaria (0.21), Latvia (0.26) and Lithuania (0.29). Compared to 2010, the average livestock density in EU28 has decreased (-2.9%). The highest relative reductions in density took place in Greece (-18.9%), Malta (-17.9%) and Denmark (-14.4%) while the highest increases happened in Austria (+7.2%), Ireland (+4.5%), Finland (+3.7%) and Germany (+3.5%).

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3 COM(2017) 753 final. http://ec.europa.eu/environment/water/water-drink/pdf/revised_drinking_water_directive.pdf

4 SWD(2016) 390 final. https://ec.europa.eu/europeaid/sites/devco/files/swd-key-european-actions-2030-agenda-sdgs-390-20161122_en.pdf

5 The section "Pressures from Agricultural" in the Member States Summary Sheets - in Section VIII- is based exclusively on data reported from the Member States under the Nitrates Directive. It should be noted that it has been observed that in some cases there are discrepancies between the data reported by the Member States and Eurostat data.

6 See Table 18 and figures 36 and 37 of Section II of the staff working document.

Comparing the reporting periods 2008-2011 and 2012-2015 the following changes in the number of animals are observed:

- Cattle: a slight decrease at EU-28 level (-0.7%)[7] with significant relative population increases in Hungary (+13.8%), Estonia (+8.6%), Latvia (+8%), Cyprus (+5%) and the Netherlands (+4.4%) contrasted by relevant decreases in Romania (-10.8%), Malta (-5.2%), Greece (-5.1%) and Lithuania (-4.2%).
- Dairy cattle: slight decrease at EU 28 (-0.9%)[8] with significant population increases in Italy (+13.9%), Ireland (+10.3%), Cyprus (+6.3%) and the Netherlands (+4.8%) and relevant relative decreases in Croatia (-19.1%), Lithuania (-14.7%), Poland (-12%), Greece (-11.3 %), Slovakia (-11.2%) and Malta (-5%).
- Pig: a decrease (-3%) in EU28[9] with more significant relative population increases in Portugal (+7.8%), Germany (+4.3%) and Luxembourg (+3.5%) and decreases in Slovenia (-28.5%), Malta (-24.8%) and Cyprus (-22.3%).
- Poultry: a decrease (-0.5%) in EU-28[10] with more significant relative increases in Germany (+37.6%), Luxembourg (+33.3%) and Finland (+28.7%) and decreases in Cyprus (-42.5%), Greece (-24.2%) and Portugal (-19%).

Fertilisers use

According to Eurostat, at EU 28 level, 9.2 kton of animal manure nitrogen were used in 2012-2014. This is a reduction of 2.6% compared to 2008-2011[11]. Manure-N use increased by more than 5% in Hungary and Latvia, while it decreased by more than 5% in Bulgaria, Cyprus, the Czech Republic, Malta, Poland, Romania and Slovenia.

At EU28 level, 1.61 kton[12] of animal manure phosphate was used in 2012-2014, a decrease of 3.1% compared to 2008-2011. Manure-P use increased by more than 5% in Hungary, while it decreased by more than 5% in Bulgaria, Cyprus, the Czech Republic, Croatia, Malta, the Netherlands, Poland, Romania and Slovenia

The total use of mineral nitrogen and phosphate fertilisers in the EU28 increased respectively by 4%[13] and 6%[14] between the reporting periods 2008-2011 and 2012-2015. There are very significant differences between Member States: from a reduction of 30% in mineral nitrogen fertiliser use in Slovakia and 46% of mineral phosphate fertiliser use in the Netherlands, to an increase of 56% in Bulgaria for both mineral nitrogen and phosphate fertilisers.

While the reduction of manure use at EU level mirrors the overall reduction of animal numbers (-3.6%)[15], the trends at Member States level are also influenced by other developments, for instance, the use of manure for energy production.

At Member States level, the use of manure N and mineral fertilizer N are very closely correlated; also the amounts used are very similar. Although this correlation also stands to some extent for manure P and mineral fertilizer P use, in countries with

7 See Table 12 of Section II of the staff working document.
8 See Table 13 and figures 26 and 27 of Section II of the staff working document
9 See Table 14 and figures 28 and 29 of Section II of the staff working document
10 See Table 15 and figures 30 and 31 of Section II of the staff working document. Based on Eurostat data for years 2010 and 2013
11 See Table 21 and figures 42 and 43 of Section II of the staff working document
12 See Table 22 and figures 44 and 45 of Section II of the staff working document
13 See Table 19 and figures 38 and 39 of Section II of the staff working document
14 See Table 20 and figures 40 and 41 of Section II of the staff working document
15 See Table 17 and figures 34 and 35 of Section II of the staff working document

high livestock density (e.g. DK, BE, NL) there is a relatively low use of mineral phosphate fertiliser compared to manure P.

Nutrient balance

The Nitrates Directive advocates for practicing balanced fertilization at farm level which entails avoiding losses by providing the crops with the right amount of nutrients they need.

Nutrient balance is defined as the difference between the nutrient inputs entering a farming system (mainly livestock manure and fertilizers) and the nutrient outputs leaving the system (the uptake of nutrients by crops and pastures)[16]. A nutrient surplus occurs when not all the fertilizers and animal manure applied to the land are absorbed by the plants or removed during harvest. A surplus represents a potential loss to the environment or risk of future loss via accumulation in the soil.

Between the reporting periods 2008-2011 and 2012-2015, both net nitrogen and phosphate balance slightly increased at EU-28 level from 31.8 to 32.5 kg N/ha[17] and from 1.8 to 2.0 kg P/ha[18] respectively. This means that there are more potential losses to the environment than in the previous period at EU level, although large variations were observed across Member States.

In the period 2012-2014, all Member States, except Romania, had a surplus of nitrogen. The highest nitrogen surpluses (> 50 kg/ha) were found in Belgium, Cyprus, Czech Republic, Denmark, Luxemburg, the Netherlands and the United Kingdom. As regards phosphates, the highest phosphorus surpluses (> 5 kg/ha) were found in Belgium, Cyprus, Croatia, Denmark, and Malta. However, eight Member States had a phosphorus deficit, with the highest deficit found in Bulgaria and Estonia.

N-discharge into the environment from agriculture

The information about the contribution of agriculture to nitrogen discharge in the aquatic environment has not been provided by all Member States[19]. According to the information reported by some Member States, agriculture remains the predominant source of the nitrogen discharged into the environment. For those that reported comparable data for both periods, the average nitrogen discharge decreased by 3%.

3. WATER MONITORING

Good monitoring of water quality is the starting point for a proper implementation of the Nitrates Directive as it is key for the detection of polluted waters and the designation of NVZ as well as for taking adequate measures in the Action Programmes. While the Nitrates Directive sets certain general provisions on monitoring, the definition of the monitoring programme and strategy (location of stations, network density, frequency and timing of sampling, etc.) is the responsibility of Member States.

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16 OECD (2013), *OECD Compendium of Agri-environmental Indicators*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264186217-en

17 See Table 23 and figures 46 and 47 of Section II of the staff working document.

18 See Table 24 and figures 48 and 49 of Section II of the staff working document.

19 Only 12 Member States provided data concerning both the 2008-2011 and the 2012-2015 reporting period. See Table 6 of Section II of the staff working document.

The data reported show uneven efforts being deployed in water monitoring by Member States as well as a high number of new stations with no trends across the EU. In fact, the intensity of the monitoring (for instance, the density of monitoring networks and the frequency of sampling) strongly varies between Member States, and might not always be well adapted to the actual pressures.

Groundwater monitoring

In the reporting period 2012-2015, the total number of reported groundwater monitoring stations in EU-28 was 34 901 stations, nearly the same as in the previous reporting period[20].

The average density of the network in the EU 28 is about eight stations per 1 000 km^2 of land area. The highest densities are found in Malta and Belgium with 130 and 97 per 1 000 km^2 respectively. On the contrary, the lowest densities are found in Finland and Sweden with less than one station per 1 000 km^2.

The average sampling frequency is nearly twice a year, and varies between less than once a year in Denmark, Latvia, Poland and Sweden to around five times a year in Belgium and Croatia[21].

Surface waters monitoring

In the period 2012-2015, the total number of reported stations in fresh waters increased at EU level by around 23% compared to 2008–2011, reaching 33 042 stations. The average density is 7.6 stations per 1 000 km^2, with the highest densities in the Czech Republic, Belgium and the United Kingdom and the lowest densities in Croatia, Germany and Finland[22].

For saline waters, the data reported show an alarming decrease of 29 % on the total number of monitoring stations in the EU, from 3 135 to 2 205 stations between the two reporting periods. This reduction was above 50% in France, Greece, Portugal, Poland and Spain[23]. The efforts deployed by some Member States in their saline water monitoring do not always reflect the relevance of their total coastal area.

The frequency of water sampling (all water bodies) varies from almost once a year in Sweden to around 20 times a year in Ireland[24].

4. WATER QUALITY AND TRENDS

Groundwater

Groundwater quality

In 2012–2015, 13.2% of groundwater stations exceeded 50 mg nitrates per litre and 5.7% were between 40 and 50 mg/l[25]. This is a slight improvement compared to the previous reporting period, in which 14.4% stations exceeded 50 mg/l and 5.9% were between 40 and 50 mg/l.

There are large differences between Member States: Ireland, Finland and Sweden had in average almost no groundwater stations exceeding 50 mg/l. On the contrary,

20 See Table 1 and Figure 1 of Section I of the staff working document.
21 See Figure 2 of Section I of the staff working document.
22 See Table 2 and Figure 3 of Section I of the staff working document.
23 See Table 3 of Section I of the staff working document.
24 See Figure 4 of Section I of the staff working document.
25 See Table 4, Figure 5, Map 1 and Map 2 of Section I of the staff working document.

in Malta, Germany and Spain respectively, 71%, 28% and 21.5% of groundwater stations on average exceeded 50 mg nitrate per litre. However, the comparability of data between Member States is limited by differences in the monitoring networks and strategies.

The lowest nitrate concentrations were observed in captive and karstic groundwater, with only 5% of stations equal to or exceeding 50 mg/l, while the highest proportion of stations equal to or exceeding 50 mg/l was observed for groundwater depths of 5 to 15 meters[26].

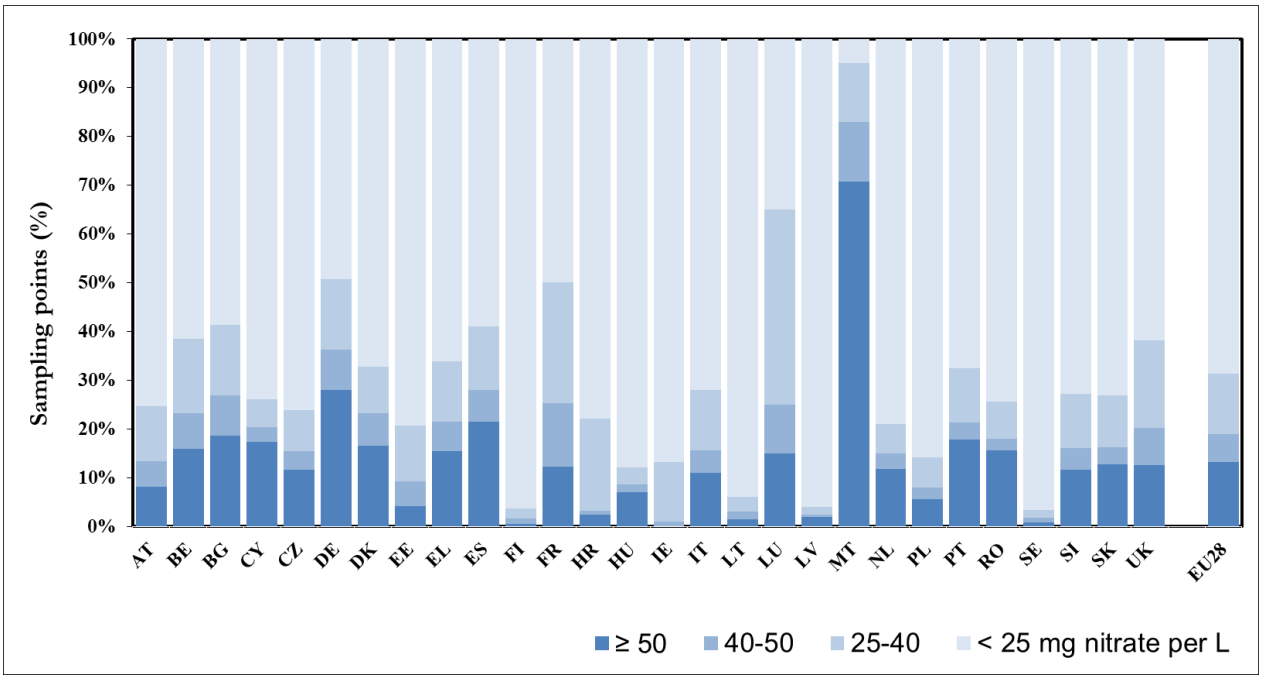


Figure A. *Frequency diagram of annual average nitrate concentrations in groundwater*[27]*. Results are presented for all groundwater stations at different depths.*

Trends in groundwater quality

Comparing water monitoring results from the period 2012–2015 with those for 2008–2011, water quality remained the same or improved in 74% of the stations. Indeed 42% of the stations in the EU showed a stable and 32% of the stations a decreasing trend. Water quality got worse for 26% of stations[28], similar to previous reporting periods. The highest percentage of stations getting better was observed in Bulgaria (40.9%), Malta (46.3%) and Portugal (43.6 %), the most stable in Sweden (98%), and the highest percentage of stations getting worse was reported by Estonia (44.4%), Malta (43.9%) and Lithuania (58.5%). Thus in some countries, we can observe a polarisation of the situation with polluted areas getting worse and clean areas getting better.

26 See Figure 6 of Section I of the staff working document.

27 *Comparison of Figure A with frequency diagram of annual average nitrate concentrations in groundwater in the reports from the Commission to the Council and the European Parliament and respective accompanying Commission Staff Working concerning the previous reporting periods may be hampered due to possible substantial differences in the number of the monitored stations.*

28 See Figure 7 of Section I of the staff working document.

Surface water

Fresh surface waters quality

Nitrates concentration

Based on annual averages of all reported monitoring stations, 64.3% were below 10 mg nitrate per litre, while 2% showed concentrations between 40 and 50 mg per litre and 1.8% exceeded 50 mg per litre. This is an improvement compared to the previous reporting period, in which 2.5% stations exceeded 50 mg per litre and 2.5% were between 40 and 50 mg per litre[29]. The highest proportion of stations equal to or exceeding 50 mg/L were reported in Malta, while Sweden, Ireland and Greece reported the highest proportion of stations with less than 2 mg/L.

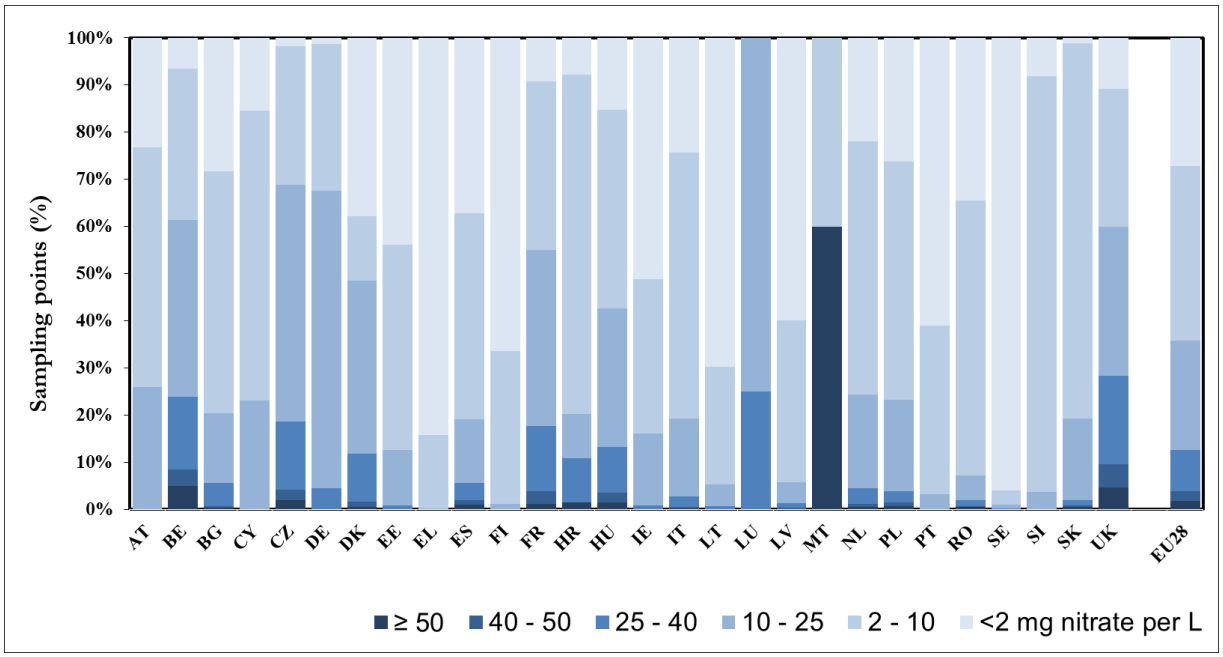


***Figure B**. Frequency diagram of annual average nitrate concentrations in fresh surface waters (rivers and lakes)*

Eutrophication

The submission of data on eutrophication is quite patchy with some Member States providing data only for certain water types and other Member States providing no data on eutrophication status[30]. Moreover, the assessment of the trophic status varied widely among Member States, not only regarding the parameters used, but also concerning the methodologies for the definition of trophic status classes[31].

Of all reported river monitoring stations, 12% and 7% were eutrophic and hypertrophic respectively, while 31% and 21% were oligotrophic or ultra-oligotrophic respectively[32]. Of all the Member States that provided data on eutrophication in rivers, Cyprus, Slovenia, Portugal, Greece, Northern Ireland, Romania, Latvia and Bulgaria showed relative low proportions of eutrophic or

29 See Table 5, Figure 8 and Map 9 of Section I of the staff working document.
30 See Section VII of the staff working document.
31 See Member States summary sheets in Section VIII of the staff working document.
32 See Figure 12 of Section I of the staff working document.

hypertrophic stations in rivers, while Austria, Luxemburg, Spain, Lithuania, Czech Republic, Belgium, Croatia and Malta showed relatively high proportions of eutrophic or hypertrophic stations in rivers. [33]

Of all reported lake monitoring stations, 18% and 8% were eutrophic and hypertrophic, respectively, while 45% and 1% were oligotrophic or ultra-oligotrophic respectively[34]. Of all Member states that reported on eutrophication in lakes, the lowest proportions of eutrophic or hypertrophic lakes were in Malta, Romania and Austria. The Member States with relatively high proportions of eutrophic or hypertrophic lakes were Bulgaria, Croatia and Poland.

Trends in fresh surface water quality

Compared to the reporting period 2008-2011, there are positive developments, indeed the annual average nitrates concentrations is getting better in 31% of all freshwaters monitoring stations, of which 9% showed a strong improvement. The situation remains the same for half of the monitoring stations. Regrettably the freshwater quality got worse in 19% of all freshwaters monitoring stations, of which 5% suffered a strong deterioration[35] [36].

No trends are available at EU level for the trophic status of fresh surface waters because of the lack of data and the differences in the methodologies to define trophic status applied by Member States.

Saline waters

In saline waters[37], nitrate concentrations are lower than in fresh water, with 0.7% of the stations equal to or exceeding 25 mg/L and 75.7% of the stations below 2 mg/L, based on annual average values[38]. There has been a slight improvement compared to the previous reporting period, in which 1.4% of the monitoring stations had annual average nitrate concentrations equal to or exceeding 25 mg/L. However, the comparison between periods is hampered by the strong reduction in the number of monitoring stations.

Eutrophication data on transitional, coastal and marine waters were only submitted by a limited number of Member States. For transitional waters, data were submitted by only eight Member States (Ireland, Italy, Latvia, Lithuania, Malta, Poland, Romania and Spain) and two regions (Flanders and Northern Ireland). For six of them, the submitted data regrettably showed a 100% proportion of eutrophic or hypertrophic waters[39].

For coastal waters, data were submitted by only nine Member States (Bulgaria, Finland, Italy, Latvia, Malta, Poland, Romania, Slovenia and Spain) and one region (Northern Ireland). In this case, five of them had more than 50% eutrophic or

33 Malta does not have any rivers or lakes but includes valley systems and standing waters as fresh surface water bodies.

34 See Figure 13 of Section I of the staff working document.

35 See Section VII of the staff working document. A large increasing trend is defined as a difference in nitrate concentrations between the two reporting periods equal or higher than +5 mg/L

36 See Figure 11 of Section I of the staff working document

37 'Saline waters' means transitional, coastal and marine waters

38 See Table 3 of Section I of the staff working document.

39 See Figure 13 of Section I of the staff working document.

hypertrophic coastal waters[40]. Marine data on eutrophication were submitted only by Italy, Latvia and Romania[41].

5. DESIGNATION OF NITRATE VULNERABLE ZONES

The Nitrates Directive requires Member States to designate nitrate vulnerable zones, which are areas that drain into waters that are polluted or at risk of pollution. When establishing the nitrates vulnerable zones, the Member States may, instead of designating specific zones, opt to apply an action programme throughout the entire agricultural land. Austria, Denmark, Finland, Germany, Ireland, Lithuania, Luxembourg, Malta, the Netherlands, Romania, Slovenia, the Region of Flanders and Northern Ireland have followed this approach.

The Member States that, instead choose to designate specific areas, need to define the criteria for designation. These criteria are based on the definition of polluted waters as set by Annex 1 of the Directive but can vary between Member States.

Including the Member States that apply a whole-territory approach, the total area of NVZ has increased since 2012, from 1,951,898 km^2 to about 2,175,861 km^2 in 2015[42] representing approximately 61% of agricultural area[43]. This means that in 61% of the agricultural land of the EU there are obligations aiming at reaching a balanced fertilisation.

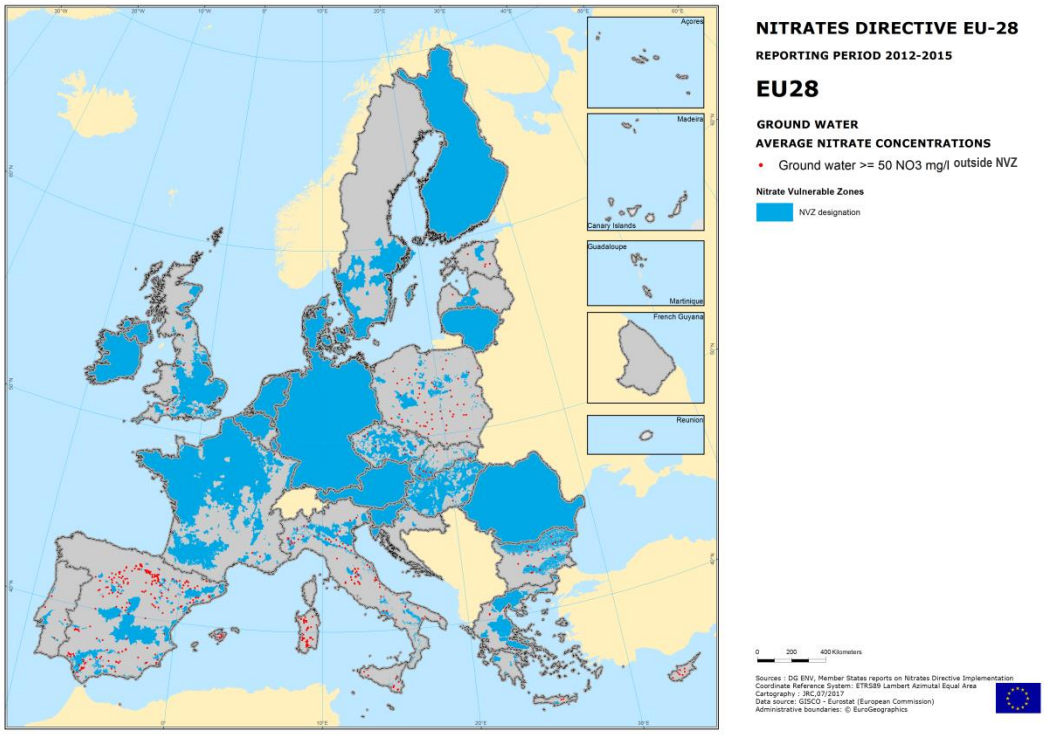
However, the information reported shows that, at Member States level, there are still areas with potential water pollution that are not included in any NVZ. Moreover, in some Member States, the designed territory is limited to a reduced area around the monitoring stations resulting in a very fragmented designation that puts in question the potential effectiveness of action programmes. As way of illustration, the map below shows the current area under NVZ and the groundwater monitoring stations with average nitrates concentrations above 50mg/L. However, as stated above the criteria used by Member States for designation may include other parameters than the average annual concentration.

40 See Figure 14 of Section I of the staff working document.

41 See Figure 15 of Section I of the staff working document.

42 See Table 25 and Map 18 of Section II of the staff working document.

43 The percentages of EU territory and agricultural area covered by NVZ have been calculated by the JRC including the areas of those Member States applying Art. 3(5) of the directive and using GIS layers provided by Member States in the context of this reporting exercise.



Map A. *Area designated as Nitrates Vulnerable Zone and groundwater monitoring stations with average nitrates concentrations above 50mg/L outside NVZ, period 2012-2015*[44].

6. ACTION PROGRAMMES

Member States are required to establish one or more action programmes that apply within designated vulnerable zones or to the whole territory. Action programmes include at least the measures referred to in Annexes II and III to the Directive. Several Member States have adopted action programmes at regional level.

Most Member States, or regions within certain Member States, adopted a new or revised action programme during the reporting period 2012-2015.

Measures in action programmes are crucial both to reduce water pollution caused by nitrates from agricultural sources and to prevent further such pollution. The definition of fertilizer application standards that ensures balanced fertilisation remains one of the most important and challenging measures. Almost all Member States have now embraced the definition of the amounts of total nitrogen allowed for each crop production. A few Member States also have defined the allowed amounts for phosphorus applications, which can be extremely important to overcome and prevent eutrophication. The ways in which these application standards are calculated and conveyed to the farmers vary in the different Member States. This is likely to influence the effectiveness of this measure due to impacts on farmers' capacity to comply with the obligations and on controls.

Another important element which requires further attention is manure storage. While all Member States have provisions on manure storage, including storage capacity,

44 The map represents the situation for the period 2011-2015, new NVZ areas may have been designated since.

enhanced action is needed in this area, including gathering more information on currently available storage capacities at farm level.

In some Member States with the action programme applied throughout the whole territory, the main challenge is to adequately target the measures to different regional pressures and hotspots. To that end, some Members States have identified areas where the measures set by the action programme are reinforced.

More and more, Member States are choosing to target certain measures to specific environmentally "worse performing farms" (high nutrients loads) while allowing more flexibility to "well performing farms". While this approach can be interesting, it can only bring results if accompanied by clear environmental objectives, stricter enforcement mechanisms and accurate nutrient management planning.

The Commission will continue to take appropriate action to ensure the quality of those action programmes and that, within the flexibility allowed by the Directive to the Member States, the measures therein are adequate and proportionate to the water quality challenges of each Member State.

7. FORECAST ON WATER QUALITY

The methods applied by Member States to assess developments in water quality are mostly based on trend analysis, scenario assessments or model simulations, sometimes combined with analyses of past and expected developments in agricultural practices. These forecasts, however, are characterized by inherent uncertainties, due to the large variations in climate and soil conditions and their effects on water quality.

12 Member States and two regions predicted a further reduction in nitrate concentrations in groundwater and surface waters, due to measures in the action programmes combined with the implementation of several agro-environmental measures included in the Rural Development Programmes. Seven Member States and three regions did not come out with a clear forecast about future water quality, for instance by predicting an improvement of water quality for certain water bodies as well as a deterioration of water quality for other water bodies.

Three Member States (Croatia, Greece and Portugal) did not report on the forecast of water quality. Cyprus and Belgium (Flanders) reported that forecasts were not possible due to the time lag between measures implementation and effect, or due to climatic conditions and hydrology.

8. DEROGATIONS TO THE LIMIT OF 170 KG N/HA/YEAR

The Nitrates Directive allows the possibility to derogate from the maximum amount of 170 kg of nitrogen per hectare per year from livestock manure in vulnerable zones, provided that objective criteria set in Annex III to the Directive are met and that the derogated amounts do not prejudice the achievement of the Directive's objectives. The standards of management required of farmers who benefit from derogations are higher than those of the action programmes, with additional obligations for nutrient planning and extra constraints on land management.

Derogations are granted by means of a Commission Implementing Decision, following the opinion of the Nitrates Committee, which assists the Commission in the implementation of the Directive. At the end of 2015, derogations were in force in

six Member States, relative to the whole territory (Denmark, the Netherlands and Ireland) or to some of their regions (Flanders in Belgium; Emilia Romagna, Lombardia, Piemonte and Veneto in Italy; and England, Scotland, Wales and Northern Ireland in the United Kingdom)[45].

9. INFRINGEMENT PROCEDURES

As of July 2017, eight infringement cases were open against seven Member States: France on the nitrate vulnerable zone designation (NVZ); Greece on NVZ and on action programmes (AP); Poland on NVZ and AP; Slovakia on monitoring, NVZ and AP, Bulgaria on AP, Germany on AP and Belgium (Wallonia) on AP.

EU Pilot investigations were addressed to four Member States in the period 2012-2015 (Czech Republic and Luxembourg on AP; Estonia on NVZ and Spain on AP and NVZ). Three other additional EU Pilot investigations were addressed to three Member States in 2016-2017(the Netherlands on the derogation decision, Denmark and the United Kingdom on AP).

10. CONCLUSIONS AND FUTURE CHALLENGES

The data on nitrates concentration show that freshwater and groundwater quality has slightly improved in 2012-2015 as compared to the previous reporting period (2008-2011). At the same time the situation is variable across the EU, with Member States where action programmes are yielding good results and Member States where further action to reduce and prevent pollution is needed. Overall and despite some positive progress, nutrients overload from agriculture continues to be one of the biggest pressures on the aquatic environment. This needs to be addressed in order to achieve the good ecological status of waters as established by the WFD.

Similarly to the previous reporting period, no conclusions can be drawn regarding the evolution of trophic status because of the lack of data and the differences in the methodologies to assess eutrophication applied by Member States. The Commission considers that the use of a common methodology for assessing eutrophication would be needed for a more harmonised application of water legislation. It is however possible to conclude that problems with eutrophication remain in many areas, for instance, in the Baltic Sea.

In 2012-2015, the intensity of monitoring of groundwater was similar to 2008-2011 while for fresh surface waters, both the number and density of monitoring stations increased. However, greater effort should be deployed by Member States on monitoring of saline surface waters as the total number of reported stations has fallen significantly during this reporting period.

In addition, efforts are needed to ensure that the turnover of monitoring stations does not affect the accuracy of water quality trends.

Moreover, there is still room for strengthening water monitoring in some Member States. This can help improving the comparability of the data concerning extent and trends in nutrients pollution as well as providing a more detailed picture of the overall quality of the EU waters and ensuring that all polluted waters are detected.

The total area of NVZ has been increasing since 2012. However, there are still improvements to be made in some Member States in designating NVZs to include all

[45] See Table 26 of Section V of the Staff Working Document.

areas draining into waters where they cause pollution as to ensure the effectiveness of the action programmes.

Overall, the quality of action programmes has improved, with tightened measures and improved methodologies to reach balanced fertilisation. However, some challenges still exist. For instance, in some Member States with the action programme applied throughout the whole territory, the measures need to be adequately adapted to different regional pressures and hotspots. Action programmes that allow for a more flexible approach at farm level can increase farmers' ownership and engagement. This approach can however only bring results if accompanied by clear environmental objectives and targets coupled with effective advice and support to the farmers to select and implement the right measures, stricter enforcement mechanisms and accurate nutrient management planning.

One challenge is how to properly take into account all nutrient inputs, including those from sources other than mineral fertilizers and manure such as soils improvers, reclaimed water used for irrigation, digestate and nutrients already available in the soil. Another challenge is to prevent nutrient losses to water and air through effective manure management. Common methodologies for nutrient excretion calculation and data collection could allow for a more harmonised estimation of nutrient balances and a more effective use of nutrients from manure.

Increased attention is needed on how to integrate the use of research and innovation to offer solutions to some of the identified challenges. EU research projects can provide insights towards a common methodology for assessing eutrophication in a more harmonised way, towards strengthening water quality monitoring for instance on the basis of state-of-the-art monitoring tools and developing effective action programmes.

Efforts are ongoing in some Member States to develop innovative manure processing technologies. In line with the Circular Economy Action Plan, these promising developments provide an opportunity to encourage recycled nutrients that can replace primary nutrients. The main challenge is to obtain recycled products that have at least an equal or higher environmental and agricultural performance than the primary nutrients they replace.

There is also, as outlined in the Commission Staff Working Document "Agriculture and Sustainable Water Management in the EU"[46], a need to improve governance and reinforced dialogue and jointly coordinated actions between all relevant stakeholders (agriculture and environmental authorities, farmers, water companies and users, etc.). In this context, also the "Action Plan for nature, people and the economy"[47] calls on Member States to improve synergies between the Nature Directives and the Nitrates Directive.

Finally, with a view to increasing transparency, providing more focused reporting and reducing administrative burden, the Commission will take the necessary action in the context of the report on "Actions to Streamline Environmental Reporting"[48].

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46 SWD(2017) 153 final: https://circabc.europa.eu/sd/a/abff972e-203a-4b4e-b42e-a0f291d3fdf9/SWD_2017_EN_V4_P1_885057.pdf

47 SWD(2017) 139 final. http://ec.europa.eu/environment/nature/legislation/fitness_check/action_plan/factsheets_en.pdf

48 COM(2017) 312 final. http://ec.europa.eu/environment/legal/reporting/pdf/action_plan_env_issues.pdf