

GRÜNE LIGA e.V. Bundeskontaktstelle Wasser Michael Bender Leiter

Greifswalder Straße 4

10405 Berlin

Tel.: +49 (0)30 40 39 35 30

wasser@grueneliga.de www.wrrl-info.de

Thursday, 7. March 2024

GRÜNE LIGA e.V., Bundeskontaktstelle Wasser Greifswalder Straße 4, 10405 Berlin

EU Commission ENV-NITRATES@ec.europa.eu

Dear Members of the European Commission,

We are writing to you as an ecological organisation concerned about the protection of water quality and biodiversity in the European Union. We urge you to uphold the Nitrates Directive (91/676/EEC) as a key instrument to prevent and reduce water pollution caused by nitrates from agricultural sources.

Summary

Nutrient pollution, particularly from nitrates and phosphates, poses a significant threat to water quality, biodiversity, and human health across the European Union. The intensification of agriculture, driven by unsustainable use of fertilisers, has led to widespread nutrient pollution, affecting over 30% of surface waters, 14% of groundwater, and 80% of marine waters in the EU. Livestock production, especially through the excessive use of nitrogen-based fertilisers for feed, emerges as a primary contributor, accounting for more than 80% of nitrogen emissions to water.

This pollution not only challenges the achievement of the Water Framework Directive's objectives but also incurs substantial costs, with nitrate removal from drinking water costing approximately 22 billion euros annually. Beyond economic impacts, nitrate pollution is linked to severe health risks, including various cancers and thyroid disease, and contributes to the degraded state of 60-70% of European soils. Moreover, it exacerbates climate change-induced water scarcity and upholds the precarious EU position of dependency on fertiliser imports from state actors including Russia.

The Nitrates Directive offers a framework for mitigating nutrient pollution through measures such as preventing and reducing water pollution from nitrates, establishing good agricultural practices, and designating nitrate vulnerable zones. While its measures have shown potential for improving water quality, inconsistent implementation and enforcement have limited the Directive's effectiveness.

To address these challenges, we recommend enhancing the implementation and enforcement of the Nitrates Directive, complementing it with mandatory sustainable soil management principles, rejecting proposals for increased nitrate allowances, and developing an Integrated Nutrient Management Action Plan. These steps aim to reduce nutrient losses by at least 50% by 2030, in line with the EU's Biodiversity strategy, thus ensuring the protection of public health, the preservation of our ecology, agricultural sustainability, and global water resources.

Nutrient Pollution and Agricultural Practices

Intensification of agriculture, largely driven by unsustainable inputs of fertiliser, has resulted in widespread nutrient pollution across Europe with detrimental effects on biodiversity and human health.

Data from the latest Nitrates Directive implementation report show that more than 30% of surface waters, 14% of groundwater and 80% of marine waters in the EU are negatively impacted by excess nutrients.1

The major source of this pollution is nutrient loss from industrial agriculture. Nutrient pollution is one of the main causes for failure to achieve good status under the Water Framework Directive (WFD)² and nutrient losses within Europe exceed the 'safe operating space' of planetary boundaries³.

These nutrient losses are driven largely by nitrogen emissions from modern, intensificationand specialisation-focused agricultural practices. Especially pernicious is the livestock production chain: Livestock production accounts for more than 80% of nitrogen emissions to water⁴.

Specifically, feed production for livestock contributes to nutrient losses via the intensive use of nitrogen-based fertilisers4. As the majority of European agricultural land is devoted to animal feed production⁵, the impact of associated nitrogen losses is enormous. Animal rearing itself causes nitrogen emissions, for example through excrement and grazing⁴. Areas of high livestock production are known hot spots for nitrate pollution. A few examples include the Netherlands, Catalunya, Brittany and the Po Valley⁶.

¹ European Commission, (2021), Report 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 2016–2019

EEA 2018 Report No 7/2018 European waters: Assessment of status and pressures 2018

³ EEA (2020) <u>Is Europe living within the limits of our planet? An assessment of Europe's environmental footprints in relation to</u>

planetary boundaries

4 Westhoek H., Lesschen J.P., Leip A., Rood T., Wagner S., De Marco A., Murphy-Bokern D., Pallière C., Howard C.M., Oenema O. & Sutton M.A. (2015) Nitrogen on the Table: The influence of food choices on nitrogen emissions and the European environment. (European Nitrogen Assessment Special Report on Nitrogen and Food.) Centre for Ecology & Hydrology,

⁵ Greenpeace European Unit (2019) Feeding the Problem: The Dangerous Intensification of Animal Farming in Europe

⁶ De Vries, W., Leip, A., Reinds, G. J., Kros, J., Lesschen, J. P., Bouwman, A. F., Grizzetti, B., Bouraoui, F., Butterbach-Bahl, K., Bergamaschi, P., & Winiwarter, W. (2011). Geographical variation in terrestrial nitrogen budgets across Europe. In M. A. Sutton, C. M. Howard, J. W. Erisman, G. Billen, A. Bleeker, P. Grennfelt, H. van Grinsven, & B. Grizzetti (Eds.), The European Nitrogen Assessment: Sources, Effects and Policy Perspectives (pp. 317-344). Cambridge University Press

Nitrate pollution exacts costs to human health, biodiversity, vital soil function, water security, and Member State coffers. Nitrate pollution in drinking water is associated with myriad adverse health outcomes, including methemoglobinemia, various cancers, thyroid disease and neural tube defects. A growing body of scientific evidence more specifically suggests that nitrate in drinking water increases the risk of colorectal cancer Numerous water treatment technologies have been developed and tested to remove nitrates from water for drinking8. Removing nitrates from drinking water costs taxpayers 22 billion euros yearly in the form of e.g. cost for drinking water treatment. 9

However, nitrate pollution still poses health risks. Farmers and residents in agricultural areas have the highest exposure to nitrate from their drinking water, especially those drinking water from shallow wells close to nitrogen sources such as crop fields or livestock feeding operations¹⁰.

The hazards to health from nitrate pollution are not limited to human populations. It has been well established by the scientific community that nitrate pollution harms aquatic and terrestrial life across multiple pathway11s. Pollution from nitrogen and other nutrients is the primary cause of hypoxic waters known as "dead zones" in which otherwise highly populated areas become uninhabitable - essentially biological deserts. Nutrient pollution is the main driver of dead zones created by humans¹² and can lead to further degradation of waters, including ocean acidification¹³. These changes inflict negative consequences for biodiversity, fisheries and recreational activities. Nitrate pollution poses particular threat to valuable European marine ecosystems home to fisheries and tourism¹⁴.

Soils and soil services are also harmed by nitrate pollution. Healthy soils can slow the movement of runoff and reduce or eliminate pollutants – including nitrates – by e.g. microbial denitrification, oxidation, soil adsorption, and uptake by plants¹⁵. However, degradation, erosion, and exposure to excess pollutants, such as nutrients lost from industrial agriculture, diminish soil's filtration and purification capacities¹⁶. It has been well established that 60-70% of European soils are degraded¹⁷. Denitrification in soils is a finite process primarily tied to the supply of reducible sulfides in the soil and once the supply is depleted, nitrates can "break through" and begin leaching into groundwater. The timing and possibility of such a nitrate "breakthrough" are unpredictable 18. This undermines the vital function of healthy soil

⁷ Jacobsen, B. H., Hansen, B., & Schullehner, J. (2024). <u>Health-economic valuation of lowering nitrate standards in drinking</u>

water related to colorectal cancer in Denmark. Science of The Total Environment, 906

8 Choudhary, M., Muduli, M., & Ray, S. (2022). A comprehensive review on nitrate pollution and its remediation: conventional

and recent approaches. Sustainable Water Resources Management, 8(113).

⁹ European Commission and IEEP, (2021), Green taxation and other economic instruments: Internalising environmental costs to make the polluter pay

10 Ward, M. H., Jones, R. R., Brender, J. D., De Kok, T. M., Weyer, P. J., Nolan, B. T., Villanueva, C. M., & Van Breda, S. G.

^{(2018).} Drinking Water Nitrate and Human Health: An Updated Review. International Journal of Environmental Research and

Public Health, 15, 1557

11 Banerjee, P., Garai, P., Saha, N. C., & et al. (2023). A critical review on the effect of nitrate pollution in aquatic invertebrates and fish. Water Air Soil Pollution, 234, 333.

12 National Oceanic and Atmospheric Administration. What is a dead zone? National Ocean Service website

¹³ National Oceanic and Atmospheric Administration. What is eutrophication? National Ocean Service website

¹⁴ European Commission. (n.d.). Nitrates Directive

¹⁵ Cheng, K., Xu, X., Cui, L., Li, Y., Zheng, J., Wu, W., Sun, J., & Pan, G. (2021). The role of soils in regulation of freshwater and coastal water quality. Philosophical Transactions of the Royal Society B, 376, 20200176

16 Groh, T. A. (2020). Grounded in Soil: Water Quality Benefits from Healthy Soils. PennState Extension

¹⁷ European Commission Joint Research Centre. (2023). A new tool maps the state of soil health across Europe. EU Science

Bender, M., Schäfer, T., Holtorf, M., Biener, D., Münster, A., Geiler, N., & Blöch, H. (2016). <u>Verminderung der</u> Nährstoffbelastung - zentrales Thema für Flussgebietsmanagement, Trinkwasserversorgung und Meeresschutz. Berlin: Grüne Liga e.V. Bundeskontaktstelle Wasser.

ecosystems and sustainable soil management in mitigating water pollution caused by agricultural nitrogen-based fertiliser use.

Nitrogen from agriculture pollutes not only our soils and waters, but also our air. In fact, approximately 95% of total ammonia (NH₃) emissions to the atmosphere over Europe originate from agricultural sources^{4, 18}. Agriculture is however also responsible for the emission of other forms of reactive nitrogen, including nitrogen oxides (NO_x) and nitrous oxide (N₂O)¹⁹. Livestock production in particular is responsible for an estimated 87% of the NH₃ fluxes from agriculture production to the atmosphere. This atmospheric pollution affects human health and ecosystems. In Germany, for example, agricultural emissions are believed to be the cause of 45% of the 34,000 annual premature deaths due to air pollution. Germany also highlights how atmospheric nitrogen pollution can disperse and cause additional damage: in the Baltic Sea, Germany contributes the least water-bound nitrogen and markedly more airborne nitrogen than nearly all other Baltic-bordering countries ¹⁸. This is a reminder that atmospheric ammonia and nitrates in water-bodies cross national frontiers and the polluting activities of respective Member States have far-reaching consequences for the rest of the Union.

Climate change will compound the problems caused by nitrate pollution. Greater rainfall intensity, particularly during winter and spring, can lead to increases in nitrate runoff from agricultural area and associated leaching to groundwater^{20, 21}. At the same time, EU security is threatened by water scarcity worsened by nitrate pollution. Nitrogen pollution was an important driver of water scarcity in 2010. While climate change-induced changes in water *quantity* indeed reduce water availability, low water *quality* will be a critical or even dominant cause of water scarcity in many river basins in the future. **Scientists predict a threefold increase in global water scarcity due to nitrogen pollution**²².

While water shortages due to nitrate pollution will challenge EU farmers, the continued application of nitrogen-based fertilisers itself places the European agricultural sector in a precarious geopolitical position. As our agricultural system is currently propped up by imports of feed and fertilisers, which has locked the Union and its farmers into an unhealthy dependency on Russia – currently the EU's primary source of fertilisers²³. This situation keeps conventional farmers exposed to volatile fertiliser prices. This conundrum was showcased as recently as 2022, when gas and fertiliser prices spiked.

As far back as 2011, the overall **environmental costs of all reactive nitrogen losses in Europe were estimated at 70-320 billion euros per year** – markedly more than the cost to reduce the pollution at its source²⁴.

¹⁹ Leip, A., Achermann, B., Billen, G., Bleeker, A., Bouwman, A.F., de Vries, W., Dragosits, U., Döring, U., Fernall, D., Geupel, M., Heldstab, J., Johnes, P., Le Gall, A.C., Monni, S., Nevečeřal, R., Orlandini, L., Prud'homme, M., Reuter, H.I., Simpson, D., Seufert, G., Spranger, T., Sutton, M.A., van Aardenne, J., Voß, M., Winiwarter, W. (2011) Integrating nitrogen fluxes at the European scale. Chapter 16 in: The European Nitrogen Assessment (Eds. Sutton M.A., Howard C.M., Erisman J.W., Billen G., Bleeker A., Grennfelt P., van Grinsven H. and Grizzetti B.) pp 345-378. Cambridge University Press.

²⁰ Gattenlöhner, U., Bender, M. and Bär Lamas, M. (2022) <u>Blitzlichtstudie "Seen und Klimawandel"</u>. BfN-Skripten 624. Bonn: Bundesamt für Naturschutz

²¹ Ward, M. H., Jones, R. R., Brender, J. D., De Kok, T. M., Weyer, P. J., Nolan, B. T., Villanueva, C. M., & Van Breda, S. G. (2018). <u>Drinking Water Nitrate and Human Health: An Updated Review</u>. International Journal of Environmental Research and Public Health, 15, 1557.

²² Wang, M., Bodirsky, B.L., Rijneveld, R. et al. A triple increase in global river basins with water scarcity due to future pollution. Nat Commun 15, 880 (2024). https://doi.org/10.1038/s41467-024-44947-3

²³ Eurostat (2023) Import volume of fertilizers from Russia in the European Union (EU) from January 2021 to June 2023 (in 1,000 metric tons). Retrieved from Statista

²⁴ European Commission (2021) Questions and answers on Nitrates Directive Implementation Report

Absent systemic intervention to the causes of nitrate-pollution, EU member states face several-fold risks. Further contamination of drinking water will bear additional costs in water treatment and poses the threat of health hazards to citizenry from nitrate exposure. Biodiversity is all but certain to continue declining if water bodies are exposed to ever more nitrate pollution. European soils, critical to intra-EU food production, risk further degradation by extensive livestock production and fertiliser-intensive agricultural practices. EU and global water security will be threatened if we further aggravate climate change-induced water scarcity by polluting our limited freshwater supply with nitrates. Both farmers and the EU's agricultural system on the whole face unpredictable fertiliser prices from Russian suppliers, highlighting the need for reduced dependence on feed and fertiliser imports. In summary, unchecked nitrate pollution will endanger biodiversity and ecosystem services, public health and member state coffers, agricultural sustainability, and global water resources.

Tool at Our Disposal: Nitrates Directive

By setting rules on the application of fertilisers (good agricultural practices), **the Nitrates Directive is crucial to preventing nutrient pollution and to achieving the objectives of cornerstone legislation** that address air quality, climate change and agriculture, such as the WFD, the Habitats Directive, the Marine Strategy Framework Directive and the Green Deal (e.g. cutting nutrient losses by at least 50% by 2030 per Biodiversity strategy)¹⁴.

The Nitrates Directive intends to protect water quality throughout the Union via:

- measures to prevent and reduce water pollution from nitrates
- establishing codes of good agricultural practices
- designating nitrate vulnerable zones (NVZs)
- monitoring nitrate concentrations of water bodies

These measures have proven effective in improving water quality and reducing eutrophication when properly implemented and enforced. For example, monitoring data from the Danish Environmental Protection Agency indicates that in areas where strict nutrient management practices have been enforced, nitrate concentrations in groundwater have decreased by approximately 25% during the period 2015-2020²⁵. Similarly, the Rijkswaterstaat in the Netherlands reports a decline of around 20% in nitrate levels in surface waters over the past decade in areas where innovative drainage systems and controlled nutrient application were introduced²⁶. Meanwhile, in Ireland, nutrient management planning the implementation of riparian buffer strips along watercourses have given rise to a 30% reduction in nitrate concentrations in surface waters from 2010 to 2020²⁷.

However, despite the potential and realized effectiveness of the Directive's measures and its issuance over four decades years ago, **groundwater nitrate contamination** *remains* a

²⁵ Grant, R., Thorling, L., & Hossy, H. (2011). Developments in monitoring the effectiveness of the EU Nitrates Directive Action Programmes: Approach by Denmark. In B. Fraters, K. Kovar, R. Grant, L. Thorling, & J.W. Reijs (Eds.), <u>Developments in monitoring the effectiveness of the EU nitrates Directive Action Programmes. Results of the second MonNO3 workshop</u>, 10-13 June 2009 (pp. 167-190). Bildhofen, the Netherlands: RIVM

²⁶ Fraters, B., Hooijboer, A.E.J., Vrijhoef, A., Plette, A.C.C., van Duijnhoven, N., Rozemeijer, J.C., Gosseling, M., Daatselaar, C.H.G., Roskam, J.L., & Begeman, H.A.L. (2020). <u>Agricultural practices and water quality in the Netherlands: status (2016-2019) and trends (1992-2019): The 2020 Nitrate Report with the results of the monitoring of the effects of the EU Nitrates <u>Directive Action Programmes</u> (RIVM report 2020-0184). Bilthoven, Netherlands: National Institute for Public Health and the Environment, RIVM</u>

²⁷ Department of Agriculture, Environment and Rural Affairs. (n.d.). Nitrates Directive

significant threat to ecosystems and human health²⁸. While Europe has seen a decreasing nitrate trend in many countries, compliance with EU Groundwater and Drinking Water Directives is still incomplete in several regions²⁹. In Germany, for example, when comparing the period of 1983-1987 to 2003-2005, significant progress was made in reducing nutrient pollution from urban areas with drops of 73% for nitrogen and 84% for phosphorus. while the agricultural sector achieved markedly smaller reductions of nutrient **pollution**: 27% for nitrogen and 7% for phosphorus¹⁸.

Likewise, the current application of the Nitrate Directive falls short in reducing nitrate contamination in previously impaired areas or preserving the higher groundwater quality of resistant hydrogeological units. The detected trends underscore the urgent need to reduce nitrate inputs to halt increasing concentrations in wells with exceeding threshold values, particularly in intermediate and deeper aquifers²⁸.

While improvement of nitrate pollution has stalled in the past decade, this is rather a reflection of unwillingness by Member States to address the issue (e.g. by not reducing livestock intensity) than of lacking effectiveness of the required measures contained within. The WFD has recently undergone a fitness check and was deemed fit for purpose³⁰. Inadequate implementation was, however, highlighted as a hurdle to success. With the 2027 deadline for Member States to comply with WFD objectives, it is of paramount importance that basic measures, including measures under the Nitrates Directive, are fully implemented.

Implementation and Enforcement

Despite the slow progress on implementation, in the last ten years, only three new infringements were launched. Several previously launched cases were closed during this time, despite ongoing issues with nitrates pollution. For instance, an infringement on Art.5 measures against Germany was closed in 2023, after a CJEU ruling in 2018. Yet, in November 2023, a German court still deemed it necessary to order two German states to draw up a programme of measures that is sufficient for adhering to the 50mg/l threshold.

The lack of adequate enforcement action has hindered the full potential of the Directive from being realised and has undermined the protection of the rule of law. It has further negatively influenced the achievement of the targets of the Water Framework Directive, with most Member States also not being on track to meet the final 2027 deadline. The impact of the Nitrates Directive would be significantly bolstered through proper enforcement action by the Commission, with positive knock-on effects for the agricultural transition and the achievement of the WFD objectives.

During the last implementation cycle (2016-2019), the Commission granted derogations to six Member States: Belgium (Flanders), Denmark, Ireland, Italy (Lombardia and Piemonte), the Netherlands and the UK (England, Scotland, Wales and Northern Ireland). In 2024 and 2025, the three derogations that are still in place (Denmark, the Netherlands and Ireland), are coming to an end; these countries, too, will need to limit the application of manure to the legal threshold of 170 kg N/ha.

²⁸ Musacchio, A., Re, V., Mas-Pla, J., & others. (2020). <u>EU Nitrates Directive, from theory to practice: Environmental</u> effectiveness and influence of regional governance on its performance. Ambio, 49, 504-516

Jacobsen, B. H., Hansen, B., & Schullehner, J. (2024). Health-economic valuation of lowering nitrate standards in drinking <u>water related to colorectal cancer in Denmark.</u> Science of The Total Environment, 906, 167368. ³⁰ European Commission. (n.d.). <u>Water Framework Directive</u>

This has already been reflected in changes in Dutch agricultural policy, which has put in place limits to permits for cattle farming. The need for these limits is the result of years of inaction from the Dutch government and does not reflect on the flexibility of the Nitrate Directive. If the Nitrates Directive had been properly implemented and enforced from the start, permit stops could have been avoided. To avoid the need for permit stops in other Member States, the proper implementation of the Directive is crucial and must be enhanced. An opening up of the Directive, on the other hand, would lead to further delays in the implementation, an even increased perception of impunity for major implementation failures. Such delays would introduce the risk of even more drastic measures, including permit stops, in the future.

Way Forward

- Heighten implementation and enforcement of the Nitrates Directive including the agricultural practices in Annex II and the WFD.
- Reject further derogations.
- Complement the basic measures of the Nitrates Directive with mandatory sustainable soil management principles via the Soil Monitoring Law
- Decline the proposal for the application of RENURE products above the 170 kg threshold
- Develop an Integrated Nutrient Management Action Plan to set out the path for how the EU should meet its already agreed targets to cut nutrient losses in half by 2030
- Do not open up the Nitrates Directive

The Nitrates Directive is a crucial piece of legislation to protect European citizens, farmers, and economies from the harmful effects of nitrate pollution. In order to affect the change it envisions, the measures laid out in the Nitrates Directive must be consistently and thoroughly enforced. That our soils have finite capacity to buffer the pollution caused by agricultural activities must be kept top of mind.

We therefore strongly urge the EC to enhance and strengthen enforcement of the Nitrates Directive and the WFD. To this end, additional derogations should be rejected. Likewise, the proposal from the Netherlands, Italy and Denmark for a revision to the Nitrate Directive allowing for the application of RENURE products above the 170 kg threshold should not be granted. Although this suggestion is framed as a means to substitute synthetic or mineral fertiliser, it would in practice enable the continued holding of unsustainably high numbers of livestock.

Sustainable land use can go a long way toward achieving the goals of both the WFD and the Nitrates Directive. In Annex II of the Nitrates Directive, basic minimum requirements for such agricultural practices are laid out. Transitioning away from extractive and linear agriculture toward agroecological and mixed farming practices, for example with crop rotation, cover cropping and reduced tillage, enhances our soil's natural filtering capacity and its ability to retain nutrients – thus diminishing nutrient runoff into water bodies and decreasing reliance on fertilisers. We urge fully implementation and enforcement of the minimum basic requirements in order to reach the objectives of the Water Framework Directive by 2027. Attempts to circumvent or dilute these rules should be disallowed.

The basic measures under the Nitrates Directive should be complemented with mandatory sustainable soil management principles via the Soil Monitoring Law to fully harness the potential of healthy soil ecosystems and the links between sustainable soil management and water protection. A more ecologically sound nutrient management system that does not serve as a lock-in or incentive to keep unsustainable practices (such as intensive livestock production) can also provide a path towards strategic autonomy.

Transitioning away from extractive and linear agriculture toward agroecological and mixed farming practices can contribute to protecting Europe's natural ecosystems to ensure long-term food security and farmer livelihoods. By minimising nitrate pollution via agriculture, the EC can protect the health of its citizens, guide the long-term economic interests of member states, and reduce the risk of pollution-induced water insecurity.

Concluding Remarks

To effectively combat nutrient pollution, we urge the immediate strengthening of the Nitrates Directive's implementation and enforcement, including stricter agricultural practices as outlined in Annex II and adherence to the Water Framework Directive (WFD). We call for the integration of sustainable soil management principles into legislation through the Soil Monitoring Law and oppose any increase in nitrate allowances, specifically rejecting the application of RENURE products beyond the 170 kg N/ha limit. It's crucial to develop an Integrated Nutrient Management Action Plan, aiming to halve nutrient losses by 2030 without diluting the Nitrates Directive's provisions. This comprehensive approach is essential for protecting water quality, supporting biodiversity, and ensuring sustainable agriculture within the EU.

Sincerely, Grüne Liga