IGB
Leibniz Institute of Freshwater Ecology
and Inland Fisheries

EU CONSULTATION

“Nutrients – Action plan for better management”

IGB Feedback

25 August 2022

Introduction, background and focus

The Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) is Germany's largest research centre for freshwaters. Our research findings help to tackle global environmental changes and to develop strategies for sustainable water management – true to our guiding principle "Research for the future of our freshwaters". Based on our research and expertise, we comment on the EU Consultation "Nutrients – Action plan for better management". While our scientific advice focuses on the impact of nutrient emissions on freshwater ecosystems, we would like to underline that aquatic systems are also closely linked to their terrestrial surrounding.

First of all, it is to be welcomed from a research perspective that the European Commission intends to develop an action plan for better nutrient management. The far too high emissions of nitrogen (N) and phosphorus (P) into aquatic ecosystems due to human activities have already severely impaired the majority of inland water bodies in Europe.Therefore, there is an urgent need for action — these nutrient emissions pose a major threat to aquatic ecosystems, their biodiversity, functions and thus, also their ecosystem services.The latter are an indispensable basis for our own lives, such as the provision of clean drinking water and self-purification, stable landscape water balance, natural flood protection, cooling effect, fishery resources or recreational spaces. Freshwater ecosystems play a major role in climate change adaptation and mitigation, and their provided services are also important in geopolitical and security policy questions.

A more sustainable water management must therefore be understood much more strongly as a central public service by European politics as well as in the member states. The ecological damage — e.g. to aquatic biodiversity — is already serious in itself, but also generates immense direct economic costs.

Effect of high nutrient loads on aquatic biodiversity

Inland waters and their floodplains are hotspots of biodiversity – but this rich flora and fauna is under severe threat because of already very heavy use pressure and the resulting pollution, especially by nutrients. High nutrient loads significantly diminish the ecological quality of our water bodies, including the diversity of flora and fauna. Heavily nutrient-polluted waters can only host generalist species. More specialised species disappear and their regional populations may become extinct, because, unlike terrestrial species, they cannot leave their current habitat. This is why a lot of European water bodies fail to meet binding environmental targets in European biodiversity and water protection, e.g. the Flora-Fauna-Habitat Directive and those of the Water Framework Directive (WFD) and why many aquatic species became rare or are threatened to extinction.

The risk of high nutrient loads in the context of climate change

The high nutrient load of inland waters becomes particularly dangerous in combination with the rapidly progressing climate change. Often, less water is available in the landscape due to decreasing precipitation and higher evaporation. Smaller water bodies warm up more quickly and nutrient concentrations potentially increase, as at lower river discharge, the dilution of point sources is reduced. In warmer water bodies, ecosystem metabolic processes run faster which can lead to oxygen deficiencies threatening aquatic fauna.

In addition, self-reinforcing negative effects occur due to intensification of internal nutrient recycling — especially under oxygen-poor to oxygen-free conditions. Thus, the bioavailability of nutrients can be increased and eutrophication further enhanced. This climate change-induced amplification of internal recycling means that external nutrient loads would have to be reduced even more than before to compensate for the effect — and this only to maintain the current nutrient status of the respective water body.

Equally problematic are more frequent and extreme storm events that cause increased nutrient loads via sewer discharges and overflow events or via erosion and surface run-off. These can result in increased loadings of nutrients, sediments, or other potentially problematic pollutants.This is in particular problematic if such pollutant enriched storm event discharges enter surface water at low or minimum flow conditions and the respective small water volume to dilute the emitted substances. These intense short-term events are often massively disrupting ecological and biogeochemical processes and can i.e. result in fish kills or even total loss of the affected populations.

Conclusion

The state of our aquatic ecosystems shows that currently existing EU environmental legislation is not able to tackle the problem of high nutrient loading sufficiently. This is due to a lack of coherence and harmonisation, but also because of a dramatic lack of implementation in the Member States.

Still, far too many nutrients from agricultural and private use of fertilizers and insufficient treatment of domestic and industrial waste water continue to enter our European inland waters, jeopardizing the foundations of life for nature and mankind alike and generating enormous economic costs. At the same time, the production of artificial nitrogen fertilisers is very energy-demanding, and natural phosphorus deposits will be exhausted in the forseeable future, requiring recovery and much reduced dispersal. Therefore, an improved nutrient management is needed.

The pollution of our terrestrial and aquatic ecosystems with high nutrient loads happens despite the already existing rich scientific evidence and mechanistic understanding for adequate targets and necessary management measures. These should be implemented as soon as possible; the implementation deficit must be urgently addressed. Integrated approaches to tackle nutrient pollution should be developed as fast as possible. Otherwise, the EU and the Member States would jeopardize its own climate and environmental goals, and the highly valuable freshwater resource for the European population.

Key to avoiding new and mitigating existent nutrient pollution is minimizing or even eliminating the emission of pollutants already at the source. The focus should always be on the precautionary principle and the direct avoidance of emissions in all processes instead of working out costly and often inefficient end-of-pipe approaches. The latter should be addressed with more consequent polluter-pays-approaches in all relevant fields.

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