

Strengths and weaknesses of the Water Framework Directive (WFD)

IGB Policy Brief



Background

The Water Framework Directive (WFD) requires all water bodies in the European Union (EU) to achieve at least good chemical and ecological status or good ecological potential by 2027. As things stand, this objective will be clearly missed.

Currently, the EU is conducting a “fitness check” of the WFD. The Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB), Germany’s largest freshwater research centre, participated in the expert consultation process.

On this occasion, the present Policy Brief of IGB addresses six key points that elucidate the strengths and weaknesses of the WFD.

Synopsis

Europe's inland waters provide nature, people and economies with valuable habitat, ecosystem services and resources. The multiple demands associated with this provision inevitably lead to conflicts of objectives. Therefore, integrative approaches are required to achieve a balanced consideration of ecosystem protection and resource use in and around water bodies.

The European Water Framework Directive (WFD) is a technically sound, target-oriented policy document. It provides one of the most advanced regulatory frameworks for sustainable water management and water protection worldwide. Thus, it is imperative that Member States adhere strictly to the principles and objectives of the WFD beyond 2027. The requirement of regular reporting on the chemical and ecological status of water bodies also needs to be maintained.

The majority of EU water bodies currently fall short of the objectives of the WFD. Since the directive came into effect, little improvement to the status of EU water bodies has been observed. Sixty per cent of all water bodies in the EU fall short of the target; in Germany, the percentages are no less than 93 for flowing and 73 for standing waters. The enormous scope of required action and inadequately harmonised legal objectives are among the main reasons for this poor performance. Equally problematic are tangible conflicts of objectives between competing legislation as well as conflicts of interests between protection and

resource use. Shortcomings in the administrative and practical implementation of the directive also play a role. Finally, freshwater ecosystems sometimes just respond very slowly to measures taken for ecological improvement, resulting in delayed evidence of success.

The implementation deficit of the WFD can be addressed by developing large-scale, integrative concepts. In the process, restoration measures must be selected and prioritised based on evidence and effect. Administrative processes must be systematically improved, and procedures for resolving conflicts of objectives need to be developed and established. To achieve these goals, sustainable water management must be systematically considered across all relevant policy areas. This applies particularly to agriculture, energy (including hydropower), transport (shipping), mining and, of course, flood control and nature conservation.

Unless there is a strong commitment to sustainable management and ecological improvement of fresh waters, their many functions as habitat and key resource in Europe cannot be preserved. Pressures to use resources are ever growing, as are global climate and environmental change. Integrative concepts provide promising approaches for analysing, weighting and reconciling the many competing interests between freshwater use and protection. The WFD offers an excellent basis to ensure this vital balance.

Strengths and weaknesses of the Water Framework Directive (WFD)

Sustainable environmental and water policy means carefully weighing all interests and needs from the standpoint of water protection and resource utilisation. The WFD offers an excellent basis for this balance also in the future. However, implementation of the directive has so far clearly fallen short of its objectives. Despite the fact that the WFD entered into force 19 years ago, 60 per cent of EU water bodies currently fail to meet the target of achieving at least good ecological status or good ecological potential. In Germany, this is the case for no less than 93 per cent of the flowing waters and for 73 per cent of the standing waters. What are the reasons for these shortcomings, and what is the scope for improvement? As part of the “fitness check” of the WFD carried out by the EU in 2019, the Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB) participated in the expert consultation. Six key points emerging from IGB’s analysis are highlighted in this Policy Brief:

1. Surface water monitoring, undertaken under the WFD, has greatly improved knowledge on the chemical and ecological status of water bodies in Germany and the EU. The collected data provide evidence of major ecological impairments and the principal underlying causes.

Monitoring of the status of water bodies under the WFD has resulted in a broad data base that enables spatially and temporally nuanced analyses of the status of European inland waters. The same data also facilitate analyses of the impacts of pollutants, climate change, and changes in water body morphology and hydrological regime. This allows for robust conclusions on the success of restoration measures and for devising realistic scenarios of the impacts of altered uses of fresh waters and their catchments.

Additionally, it is now possible, due to the EU-wide harmonisation of assessment procedures (intercalibration), to assess the ecological status of water bodies in a reasonably standardised way, and to determine and evaluate the causes (stress factors) of impairments not only locally, but also on a regional and EU-wide level.

The main stress factors are habitat destruction and degradation in water bodies and riparian zones as a result of river engineering (including bank and bed reinforcement, embankments, weirs, hydroelectric power plants), changes in hydrological conditions (damming, hydropowering, water abstraction) and anthropogenic discharges (including wastewater discharge, fertilisers, salt, suspended matter in soil runoff, and chemicals, including pesticides and pharmaceutical residues). What is more, fresh waters are impacted by climate change,

invasive species, consequences of mining activities (including acidification and heavy metal inputs) and improper fisheries practices.

2. Reasons for the widespread failure to achieve the objectives of the WFD and slow overall progress are the insufficient scope and pace of implementation, as well as insufficient or inappropriate restoration measures.

The scale of most restoration projects to date has been too small to achieve notable environmental improvements. Only rarely are plans presented to restore extensive sections of river networks. Besides financial and administrative constraints, such large-scale approaches are hampered by the often intensive use of fresh waters and their riparian areas. Visionary concepts are needed here, such as those that have been envisaged and, in part, already implemented in France (Loire), Austria (Danube) and Sweden (Vindel).

A key element of such concepts is the restoration of hydrological and ecological connectivity. Single measures to restore the longitudinal connectivity of rivers obstructed by hydroelectric power plants or other transverse structures do not usually lead to the desired recovery of target species, because structural impairments prevailing in other river sections prevent recolonisation. In addition, measures to restore longitudinal connectivity have so far been limited to upstream fish migration. Estimates show, however, that 30 to 80 per cent of fish are killed or seriously injured when passing hydroelectric turbines during downstream migration. In addition, transverse structures such as hydroelectric plants impede sediment

transport, which is extremely important for river dynamics. Only very few measures that could counteract such pressures have been implemented to date.

Another major problem is that applicability of the WFD is restricted to the river channel below the mean water level. Consequently, the WFD fails to support measures that reconnect river channels to their floodplains. Natural river dynamics, however, critically rely on channel-floodplain connections, which are needed to create the diverse aquatic and riparian habitats in river corridors as a prerequisite to establish self-sustaining populations of migratory fish species, such as salmon and sturgeon, requiring particular habitat conditions.

General answers as to which specific restoration measures are required on what scale to achieve the required good ecological status are currently not possible. Therefore, to improve forecasts, both successful outcomes and failures of all current and future projects ought to be systematically documented. It must be recognised in this context that improvements may only become apparent after extended periods. However, recolonisation potentials are extremely limited where species have disappeared from large areas or where populations have been seriously depleted. This limitation applies to fish as much as to aquatic plants and invertebrates.

3. Many political and administrative levels – ranging from the EU Commission to local stakeholders – are responsible for implementing the WFD. Conflicts of objectives arising during the implementation of the WFD are apparent at all levels. Some of them are rooted in the European legislation.

Several pieces of EU legislation and various EU programmes that promote detrimental uses of fresh waters are in clear breach of the objectives of the WFD. Examples include large parts of the Common Agricultural Policy (CAP), which promotes intensive agriculture also near water bodies, resulting in substantial inputs of pollutants to surface waters. For example, the EU Nitrate Directive permits up to 50 milligrams of nitrogen per litre of seepage water from agricultural land, a concentration that greatly exceeds the WFD target values for surface waters.

In the transport sector, the Trans-European Transport Network (TEN-T) promotes the expansion of waterway and canal projects, despite the fact that large rivers in particular fail to achieve good ecological status. Another example is the EU Directive on the promotion of the use of energy from renewable sources, which has prompted many Member States to provide economic incentives to expand small-scale hydropower. This development is not only fundamentally opposed to the goal of restoring the longitudinal connectivity of river systems. It is also pro-

foundly irrational, given that small hydroelectric plants contribute only marginally to power generation. Promotion of the cultivation of energy crops such as maize, which have undergone massive expansion for biogas production, poses an additional threat to fresh waters.

The EU Flood Risk Management Directive (FRMD) is also critical from the standpoint of the WFD, because flood risk management plans often call for major technical measures such as barrages and river polders, which greatly change the flow regime of rivers. If, however, flood protection is achieved by giving rivers and their floodplains room to mitigate high-flow events, there is great potential for synergies with the objectives of the WFD.

As long as wrong incentives and serious conflicts of objectives with the WFD persist in European legislation, they translate into national law and regulations. As a result, competing legal entitlements and deficiencies in the implementation of the WFD propagate all the way down to the local level. These fundamental shortcomings are in urgent need of correction.

4. The objectives of the WFD cannot be achieved by water management authorities alone. Instead, sustainable water management needs to be considered across all areas of policy and administration to achieve multiple goals simultaneously. Stakeholders with vested interests in the use of fresh waters must crucially contribute to avoiding or mitigating any negative impacts.

Fundamental improvements in the ecological status of water bodies cannot be expected in the future, unless the multiple conflicts of objectives in and around water bodies, riparian zones, floodplains and entire catchments are systematically addressed and appropriately weighted. However, cross-agency regulations to reconcile competing interests are currently lacking. Coordination thus needs to be improved, especially among administrative bodies concerned with water quality management, flood control, nature conservation, agriculture and shipping, as well as energy management and resource extraction; in residential areas, urban and transport planning must also be involved. Derogations in favour of economically insignificant uses such as small-scale hydropower (see above) must be systematically avoided, as is explicitly envisioned in the WFD.

The multiple pressures placed on fresh waters require management measures to be much more multifunctional than in the past. Ideally, such broad approaches will simultaneously improve ecological status, flood control, nature conservation, tourism and the recreational value of fresh waters. The resulting synergies increase cost efficiency and facilitate implementation of the planned measures.

Such concepts, however, receive insufficient support from the current sector-based support programmes and financial instruments. Therefore, future water management measures require cross-agency organisation and funding.

The required close coordination would be made easier if the key stakeholders were involved in planning and decision-making processes at an early stage and if competing interests were considered in a transparent and balanced manner. This includes questioning and possibly restricting established uses to achieve the WFD objectives, as well as ensuring that stakeholders with vested interests in the use of water bodies pay their fair share according to the costs-by-cause principle.

Matters are complicated by the large number of responsible political and administrative levels, ranging from the European Commission to local stakeholders (see point 3). Moreover, responsibilities for monitoring and the planning and local implementation of measures often rest with different agencies, and clear information and control instruments are lacking. This slows communication and decision-making processes, and also reduces their transparency. As a result, decisions and practical measures taken at the local management level, such as municipalities and associations, tend to be only weakly linked to the objectives laid down in management plans. This, too, increases the risk of failure in meeting the WFD objectives.

5. Efficient implementation of the WFD requires numerous improvements in water management practice. These include the development of stress-specific assessment tools and the systematic reporting of partial successes.

In practice, the effects of restoring fresh waters often fall short of expectations – even when stress by the identified factors has been reduced. One of the reasons is that, in many cases, measures set out in management plans are selected not on account of their effectiveness, but based on conservative feasibility assessments (e.g. acceptance among user groups or land prices).

In addition, most of the assessment tools currently in use are largely restricted to documenting general

declines in ecological status. However, to derive strategies for successful restoration and to select appropriate action based on these strategies, the specific causes of ecological impairments must be understood. Systematic methodological refinement of stress-specific assessment methods and models would be one element conducive to meeting this objective.

WFD monitoring should involve documenting not only the ascertained overall ecological status, but also partial improvements, so that other projects can learn from experience elsewhere. This notwithstanding, it is important to adhere to the “one-out, all-out principle” encapsulated in the WFD, because water bodies are complex ecosystems requiring equal consideration of multiple quality parameters. Furthermore, monitoring reports could also demonstrate how projects contribute to objectives other than restoration, such as flood control, nature conservation and enhancing recreational value, in a bid to increase public acceptance of the measures taken and the costs involved.

6. Concepts developed in social-ecological science have potential to integrate different policy and administrative areas and to increase public awareness of the relevance and usefulness of the WFD. Application of such concepts in water management would markedly improve the implementation of the WFD.

Integrative concepts such as those underlying ecosystem services, Blue and Green Infrastructure (in France, *Trames Bleues et Vertes*) and river development corridors (in the Netherlands, *Ruimte voor de Rivier*; in France, *Espace de liberté*) may help overcome fundamental obstacles in the implementation of the WFD. These approaches are particularly promising because they link freshwater protection and use to possible courses of action across multiple sectors and to the overarching objectives of sustainable water management. They also enable objectives and measures to be prioritised across space in catchments, as well as clarifying to the public the benefits of any efforts made. The concept of ecosystem services also supports transparent communication, planning and participatory processes for all stakeholders.

Conclusion

From an ecological perspective, the WFD provides one of the best regulatory frameworks worldwide for the protection and sustainable use of fresh waters.

Effective protection of water bodies in Germany and the EU would be seriously jeopardised if the principles and objectives of the directive were questioned or weakened.

The limited improvements to date in the ecological status of water bodies are an indication of major shortcomings in the implementation of the WFD. To overcome them, new integrative approaches are urgently needed at the policy, administrative and practical implementation level.

Imprint

Editor

Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB)
in the Forschungsverbund Berlin e.V.
Müggelseedamm 310
12587 Berlin, Germany
Phone: +49 (0)30 641 815
E-Mail: info@igb-berlin.de
www.igb-berlin.de/en
Facebook: IGB.Berlin
Twitter: @LeibnizIGB
Newsletter: www.igb-berlin.de/en/newsletter

Responsible authors

Jörg Freyhof, Mark Gessner, Hans-Peter Grossart, Sabine Hilt, Sonja Jähnig,
Jan Köhler, Thomas Mehner, Martin Pusch, Markus Venohr, Christian Wolter

Editorial coordination

Johannes Graupner

Layout

unicom Werbeagentur GmbH

Cover picture

Agriculture and settlement, road, rail and shipping traffic: waterbodies and their floodplains, such as the river Moselle, are often heavily used. Therefore, water protection and resource use should be more balanced. For this purpose, the European Water Framework Directive (WFD) is a technically sound and target-oriented policy document.

© Tama66/pixabay

About this publication

“Research for the Future of our Freshwaters“ is IGB’s guiding principle. This involves giving objective and evidence-based information and advice to policymakers, authorities, associations, industry, educational institutions and the public. Within the institute’s publication series called *IGB Outlines*, which includes the *IGB Policy Brief*, IGB disseminates evidence-based information to the public free of charge. Responsibility for the content of the publications rests with the respective authors.

It is generally permitted to disseminate the complete *Policy Brief*. If you quote from the document in other publications and formats, we would be interested in hearing about it.

Proposal for citation

IGB (2019): Strengths and weaknesses of the Water Framework Directive (WFD). IGB Policy Brief, Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany.

DOI: <https://dx.doi.org/10.4126/FRL01-006416917>

Copyright: IGB, October 2019

With the exception of images and illustrations, the content of this document is licensed under Creative Commons BY 4.0 Germany.