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Review

The Water Framework Directive and Agricultural Diffuse Pollution: Fighting a Running Battle?

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Abstract: In order to provide a common ground for the Special Issue 'Water quality and agricultural diffuse pollution in light of the EU Water Framework Directive,' this review sets out to provide a concise overview of the academic literature on two topics. First, we review the issues in the governance literature on the 'wicked problem' of diffuse agricultural sources focussing on three principles: (1) fragmentation and the distribution of power to address diffuse sources, (2) the problem of source-oriented and effect-oriented measures, and (3) contested knowledge for policies for diffuse sources. Second, we briefly sketch the literature on policy instruments and confront that with the scholarly understanding of addressing diffuse agricultural sources under the Water Framework Directive (WFD).

Keywords: diffuse pollution; Water Framework Directive; water governance; water quality; nutrients; policy integration; source-based measures; effect-based measures; science-policy interface; policy instruments

1. Introduction

All over Europe, Members States are investing substantial effort to improve the quality of water in order to achieve clean and healthy rivers, lakes, estuaries, coastal waters and ground water. The cornerstone of this effort is the EU Water Framework Directive (WFD/2000/60/EC). The Water Framework Directive (WFD) was published in 2000 and aims to expand the scope of water protection to surface waters and ground water and to achieve 'good status' (or 'good potential') for all waters by a set deadline. It is ambitious in that it wants to get polluted waters clean again and to ensure that clean waters are kept clean.

As an exponent of a new generation of EU directives, the WFD introduced important governance innovations in water management. Firstly, the Directive addressed biological goals rather than environmental conditions. The water policy was to leave its old management paradigm of controlling pressures in isolation and move towards a holistic and integrated approach [1]. Secondly, this regulatory framework was built around new policy concepts, asking Member States to set up river basin plans and thereby following units that are close to geographical and hydrological boundaries rather than administrative borders [2]. Thirdly, next to stipulating the general goals and principles of realising a good ecological status for all waters—at the latest in 2027—and specifying EU wide norms for Priority Substances, the directive leaves flexibility to the Member States [3]. Countries make their

own implementation choices, define targets and formulate programmes of measures. The ambitions of Member States are controlled by monitoring systems, guidance documents, calibration groups, etc., creating 'controlled self-disciplining of Member States' [4], while the Common Implementation Strategy leaves quite some room for discretion [5,6]. Comparative research has demonstrated the differences in which European countries have transposed the Directive, organised implementation and struggled with its progress [7–10].

While many issues to realise a better ecological quality of waters remain, evaluations of the first and second round of River Basin Management Planning pointed out that diffuse sources of nutrients (phosphorus and nitrogen) and pesticides from agricultural sources are an especially stubborn problem [11–13]. A large proportion of Europe's water bodies, particularly in the regions with intensive agriculture and high population density, have poor ecological status and are affected by diffuse pollution pressures. Elsewhere, similar observations are made, e.g., in China [14], the US [15,16] or Australia [17]. With the use of fertilizers and chemicals for pest control, intensive agriculture emits pollutants to water bodies via various processes and routes. We understand diffuse pollution to be sources that "are indirectly discharged to receiving water bodies, via overland and subsurface flow and atmospheric deposition to surface waters and leaching through the soil structure to groundwater during periods of rainfall and irrigation" [18]. Excessive nutrient concentrations in water bodies cause eutrophication and pesticides are toxic to aquatic ecosystems, leading to a detriment of waters for humans and wildlife alike. Together, these forms of diffuse pollution can increase health risks, water treatment costs and ecological damage.

The fitness check of the WFD concluded that the directive is fit for the future of European water governance, yet diffuse sources remain a critical issue. Without addressing nutrients and pesticides, reaching WFD goals will be impossible in many Member States [19,20]. At the same time, WFD programmes of measures that directly intervene in the emission of nutrients or pesticides (for surface water and ground water) are rare. Diffuse, nonpoint agricultural sources are addressed in other agricultural policies, dealing with manure and fertilizers, pesticides and rural development. Comparative understanding of policy responses in different Member States is key in order to derive lessons to render policies more effective. Systematic comparative analyses on Member States' policies for diffuse sources in relation to the WFD are scarce. While there is some comparative literature on policy approaches for nutrients [21–23], pesticides [24–26], agri-environmental schemes [27] or soil [28] in different countries, they only implicitly relate to the WFD and are relatively old. Here, we explicitly focus on the relation between implementing the WFD and policies for diffuse agricultural sources.

On theoretical grounds, one may expect empirical differences in the way Member States address diffuse agricultural sources. First, instruments to address diffuse sources are various [29] and there is discretion to choose modes of governance and related instruments. Previous comparative governance research on the WFD showed a variety of modes of governance, with different mixes of strategies, instruments and measures on different levels of governance [4,30]. Second, the limited progress in tackling non-point sources, the complexity of diffuse routes, the various policy domains involved, the incomplete understanding of establishing sources and effects, the limited political acceptability of regulatory instruments, the high stakes for actors involved and the contesting of knowledge have led many to label the issue as 'wicked' [15,31]; a 'wickedness' that is addressed differently by Member States.

To address the wickedness of diffuse agricultural sources, we observe three principles of the Water Framework Directive (WFD/2000/60/EC) that we believe are central to its governance. Nevertheless, those principles raise specific questions.

- First, the design of the Directive "should provide a basis for a continued dialogue and for the development of strategies towards a further integration of policy areas" (emphasis added). To what extent has the WFD succeeded in creating a more holistic, encompassing toolbox for ecosystem-based management and implementation? Do its structures make better alignment of different relevant policy fields possible, i.e., regarding water and agricultural policies?

- Second, the Directive stipulates that "environmental damage should, as a priority, be rectified at source" (emphasis added). Identifying the sources of pollution and their costs is pivotal to help realise the principle that 'the polluter should pay.' This raises questions on the relationship between source-oriented and effect-oriented measures in relation to agriculture's impact on the water quality.
- Third, the directive stipulates that in developing policies "the Community is to take account of available scientific and technical data." They are to develop monitoring and assessment systems that provide a "systematic and comparable basis for Member States to develop programmes of measures aimed at achieving the objectives established under this Directive" (article 36, 2000/60/EC). In decision-making with that knowledge, the 'precautionary principle' is key, i.e., avoiding risks, in the absence of certainty. This issue raises the question to what extent knowledge-for-policy is accepted or contested in the context of dealing with diffuse pollution of water systems.

In order to provide a common ground for the Special Issue 'Water quality and agricultural diffuse pollution in light of the EU Water Framework Directive,' this review sets out to provide a concise overview of the academic literature on two topics. First, we review the literature focussing on the three aforementioned principles that are raised in the Directive: (1) fragmentation and the distribution of power to address diffuse sources, (2) the problem of source-oriented and effect-oriented measures and (3) the contested knowledge-for-policy for diffuse sources. These three topics form the backbone of Section 2. Second, we briefly sketch the literature on policy instruments and confront that with the scholarly understanding of addressing diffuse agricultural sources under the WFD. This is dealt with in Section 3.

For the sake of focus and brevity, our review focussed on the governance literature on diffuse agricultural sources in relation to the WFD. Therefore, the academic literature that focussed on either diffuse agricultural sources or the Water Framework Directive was considered outside the scope of this review. We selected the literature by searching Web of Science and Google Scholar on "Water Framework Directive," "Diffuse sources" and "governance" or "policy" or "instruments." This corpus was then analysed on the aforementioned topics.

2. Water Framework Directive's Principles in Practice: A Review

2.1. Fragmentation and the Distribution of Responsibilities and Competencies

A key dilemma in the Directive is that it stipulates how plans are to be made and on which principles policy should be based, but in itself it does not provide additional instruments for addressing the various issues that affect water quality. With respect to diffuse agricultural sources, the activities leading to the emission of nutrients or pesticides are addressed with various policy schemes involving economic, environmental and social interests. Usually, this entails governmental departments involving those different domains, requiring horizontal policy coordination and integration (described and analysed in plenty of academic literature [3,32–34]). Often, regional authorities may also be made primary responsible for tasks related to diffuse sources, leading to a strongly felt need for vertical coordination in realising WFD objectives (cf. discussions in [35–37]).

The Water Framework Directive instigated the Member States to integrate policies from different policy sectors. However, Member States differ to the extent in which their institutional structure proved to be durable to the reorganisations instigated by the Directive [10]. In fact, the Directive's ambitions to realise holistic and integrated approaches to water management faces the realities of institutional fragmentation across vertical administrative levels and horizontal policy domains [1]. Most Member States have opted to only slightly adapt traditional administrative structures and procedures to the WFD, leading to significant barriers to the enabling of multi-sector integration and governance championed by the WFD. For example, work by Moss [38], who analysed the institutional misfit between the water management structures in Germany and the WFD's catchment management requirements, indicated cross-sectoral cooperation to have low priority.

The fitness check of the Water Framework Directive [20], its associated Directives and the Floods Directive, which was published in December 2019, conclude that they are overall fit for the purpose. However, the WFD's objectives have not been reached fully, largely due to (amongst others) insufficient integration of environmental objectives in sectoral policies [19]. Several cases, documented in the academic literature and in the Commission's implementation reports, show that programmes of measures do not include enough measures that target particular environmental problems or only include measures that mainly concern the water management sector [39], while direct measures resulting from the Nitrates Directive prove not to be sufficient to reach WFD's ambitious ecological goals. As part of the Open Public Consultation of the Fitness check, stakeholders were asked to provide their views on the coherence of the legislation with other sectoral policies. The areas seen as least coherent include agricultural policies, transport policies, chemicals policy and climate change [19,20].

Currently, the academic debate is ongoing whether water quality concerns should be mainstreamed in other policy domains [40], or whether more integrated policy is only possible with more dedicated organisational structures [10]. While open questions remain on which degree of 'integration' is needed for effective policy-making, addressing diffuse sources in any case requires an effort to rethink the competencies and responsibilities of the different actors involved.

2.2. Source-Oriented and Effect-Oriented Measures

A second principle of the WFD stipulates that 'environmental damage should, as a priority, be rectified at source' and that the costs are paid by the polluter (2000/60/EC, point 11). This refers to the general principle of 'preventive action' of the EU. Article 191 (Section 2) of the Treaty on the Functioning of the European Union (adjusted 2012/C 326/01) states the following: "Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay.".

The WFD indeed promotes a shift from traditional end-of-pipe solutions towards sustainable catchment management [41]. Based on an in-depth understanding of catchments, water management should improve the water system as a whole. In an ecological vision on water systems, it considers human activities as a source of disturbance and water quality degradation [42]. For that reason, the WFD adopted the Drivers-Pressure-State-Impacts-Response (DPSIR) framework, which aims to provide a systemic understanding of the relationship between environmental effects, their causes and measures to take [43], in an approach that requires a Programme of Measures to manage the anthropogenic pressures in order to improve ecological quality of the water system. Following this principle of preventive action, one might expect that source-based measures would be preferred in the WFD, especially with the problem of diffuse pollution that is explicitly mentioned in describing the problems to address in the Programmes of Measures (WFD/2000/60/EC, art. 11). However, this is not obvious at all.

Part of the answer here is that the WFD refers to other Directives, which do give tools and standards for the diffuse pollution of nutrients, e.g., the Nitrates Directive (1991/676/EEC). However, as was discussed before, these measures are not sufficient for the quality of water ecosystems and the good status conditions for plants and animals. More measures are necessary. Possible source-based measures are: reducing chemical or organic fertilisers (e.g., using less than the Nitrates Directive standard of 50 mg/l nitrates or less than the regular application standards for organic fertilisers of 170 kg N/ha) or reducing cattle to prevent nutrients pollution of surface water. In short, this would mean extensification in light of environmental effects. These measures are (mostly) taken by the farmers themselves. Other source-based measures would contain measures interfering with the structure of agriculture, e.g., having a phosphates-cap on animal production more generally. Lighter forms of source-based measures are catch crops (paid by the farmer) to take up the extra nutrients of plants.

The European Commission sometimes stimulates these measures, but mostly when these are either conditions for derogation or voluntary measures in a subsidised programme.

The OECD [44] confirms the tendency to move towards effect-based measures and payments for diffuse pollution. It points to the difficulties of dealing with non-point source pollution, the poor enforcement in many countries, the problem of ownership rights (with zoning instruments, for example), institutional barriers and historical contamination leading to knowledge barriers [45] (p. 91).

Scrutinizing the nature of measures taken in different countries, there is increasing evidence that the WFD has difficulties with directly intervening in agricultural policies, especially when source-based measures are involved. These obviously interfere more with the 'business model' of farmers, and effect-based measures give more flexibility and options for differentiation. Very often, effect-based measures are voluntary in nature and compensated by regional, national or European programs.

Based on empirical research, it was concluded that Programmes of Measures often target symptoms rather than causes of water degradation [46]. Kail and Wolter [47], for example, demonstrated for Germany that many Programmes of Measures addressed point source pollution for many water bodies, for which point source pollution was not listed as a pressure, indicating that water managers often continue with traditional water management practices. It is like water managers tend to implement 'easy fixes' to pick low-hanging fruit without critically assessing what the real pressures are on the aquatic ecosystem, a conclusion that was also drawn in the communication document accompanying the fourth WFD implementation report [48].

In conclusion, there are different reasons why source-based measures are lacking in Programmes of Measures, but one of the reasons is that these are politically unwelcomed and effect-based measures are easier to support and are often paid by the community. This is why we clearly find more voluntary, effect-based measures in different countries [30] (this Special Issue). In many cases, the polluter has to be seduced by financial incentives (subsidy programmes) to reduce diffuse pollution by nutrients. We also see that more technical measures of water treatment are often paid by the water manager or by regional development programmes, thus, in effect, costs are spread over the local, regional, national or European tax payers.

2.3. Contested Knowledge-for-Policy

Similar to other complex environmental issues, addressing water quality problems heavily relies on science and knowledge. This goes from the practices for determining and assessing the 'good ecological status' and the corresponding reference conditions [49], to modelling the various sources of pollution [50], to determining the cost-effectiveness of measures [51,52]. Science and authoritative knowledge have been indispensable building blocks for hierarchical regulatory projects of the state [53,54]. The quest for improving the effectiveness and efficiency of policies to reach better water quality fuels much of the scientific research on the WFD [40,55].

Governments throughout the western world use science as the central instrument to base policy programs on, whether based on approaches of command-and-control or other governance tactics such as subsidy programmes, voluntary schemes or mixes of policy instruments [56,57]. With the scientisation of politics and policy, scientific knowledge faces risks of being challenged by those whose interests are at stake or those opposing the expanding regulatory project of the state itself [58]. Denmark proved an exemplary case for this process when it aimed to implement ambitious agricultural measures [11]. Nevertheless, just a few studies address the topic of knowledge production for developing policies to address diffuse agricultural sources under the WFD. In this literature on contested knowledge-for-policy, we observe three sub-themes.

The first theme concerns the use or non-use of knowledge about diffuse sources in political decision making. For example, Glavan et al. [59] looked into the barriers to why commissioned research on pollutants from agricultural sources does not affect policy, and suggest a lacking political will, protocols and funding. Due to the complexities of the routes of substances from farm to water body, modelling and measuring are highly challenging, and establishing the effectivity of measures can

take decades to monitor the outcome [55]. In the development of more detailed models of, e.g., all the different nutrients in a particular water body, the political question of who should be responsible for what reduction goal looms. Uncertainties or conflicting knowledge claims are used to stall policy progress [11]. Various examples of 'data traps' in which ever more detailed information is provided in policy controversies over agricultural sources can be given across Member States [60,61].

A second theme deals with the organisation of knowledge production. Approaches to this theme differ. On the one hand, studies suggest institutional design principles for an enhanced WFD science-policy interface [62], e.g., on how to forge close contacts between scientists and policy makers and to develop a single conceptual framework for a science-policy interface. On the other hand, studies aim to understand the effects of ongoing institutional reform for knowledge production practices, e.g., [63]. This latter topic especially raises questions about how the claimed (but disputed, e.g., [2]) shift from government to governance in the water-and agriculture domain may introduce new arrangements at the science-policy interface, such as those aiming at fostering learning among stakeholders as well as linking different types of knowledge held by different actors [37,64].

A third theme concerns the intersection of the participatory ambitions of the WFD and new modes of knowledge production. The ambitions to strengthen stakeholder inclusion in water governance, the adoption of voluntary approaches towards farmers or even the devolution of tasks to non-governmental actors challenges the 'normal' procedures of regulatory science. Studies focus on co-creation and the interplay between scientific and local knowledge [11,65], more effective forms of exchange between science and the farming practice [66] or the role of knowledge in collaborative governance [64].

Taken together, a central claim of scholars of science-policy relations is that advancing scientific knowledge alone cannot resolve the problems of controversy and delay in advancing policies to address diffuse agricultural sources. Also, developing policies under conditions of uncertainty is an inherent feature of governing diffuse sources. The institutional innovations to address diffuse sources [67], such as knowledge co-creation, participatory monitoring or the opening up of decision councils, have varying degrees of success. Notwithstanding the democratisation or quality ideals to which those innovations may appeal, the WFD literature concludes that the hierarchical regulatory approach leaning on expert knowledge sometimes runs out of steam. Advancing our understanding of how knowledge is organised within the governance of diffuse pollution may help understand why controversies over data and knowledge emerge in some cases, while much less in others.

3. Different Modes of Governance and Policy Instruments

These three main themes, integration and fragmentation, source- and effect-based measures and the intricacies of knowledge production, have repercussions for the organisation of governance related to the WFD. For this reason, the WFD emphasises integration, stakeholder participation and cost recovery more generally. In the Water Framework Directive, public participation is statutorily incorporated into the production of individual river basin management plans (WFD article 14). However, this is only an illustration of the extent to which we witness a shift 'from government to governance' [2]. This is generally seen as the development wherein non-governmental organisations (civil society bodies, private firms, their representative associations and other lobbying groups) have rising influence in policy-making. However, especially for the WFD, other related dimensions of governance are just as important, such as governance across policy sectors (multi-sector governance) and interaction across scales (multi-level governance). Policy integration and the scaling of governance are important themes of implementation.

However, what does this mean for the level and nature of instruments and measures chosen? Taking a combination of the three themes as a starting point, we would expect to have integrated, source based, informed and tailor-made instruments and measures that are both effective and co-produced with the target groups involved. However, this also implies a profound support and consensual process of decision making in choosing measures and instruments. The implementation reality of the WFD (including the Nitrates Directive) very often shows complex processes of selection towards effect-based

instead of source-based measures and avoiding (additional) direct mandatory regulation of diffuse pollution. Because of this, there is great reliance on voluntary measures and subsidy programmes. In this section, we will further elaborate upon the instrument choices of the WFD.

In the traditional policy instrument theories, three main types of policy instruments are distinguished [68]: regulation instruments, economic policy instruments and information instruments. These instruments are proverbially called (respectively) sticks, carrots and sermons. Hood [69] criticises this classification as it tends to overlook instruments that are based on the physically structuring of environments so as to shape behaviour. Following Hood's [69] critique, we add 'physical instruments' to the regulatory, economic and information instruments of Bemelmans-Videc et al. [68].

- Regulation refers to "measures taken by governmental units to influence people by means of formulated rules and directives, which mandate receivers to act in accordance with what is ordered in these rules and directives" [68]. Regulation instruments can involve enforcement and fines, detention or other punishments if the regulation is not observed.
- Economic instruments are described as instruments "involving the handing out or the taking away of material resources while the addressees are not obligated to take the measurements involved" [68]. Subsidies and grants are examples of this type of instrument.
- The information (or exhortation) instrument wants to discourage undesired behaviour and to encourage desired behaviour, mainly by providing understanding of the consequences of behaviour. Bemelmans-Videc et al. [68] define these policy instruments as "attempts at influencing people through the transfer of knowledge, the communication of reasoned argument, and persuasion" [68].
- Physical instruments are those instruments that aim to intervene in the possible behavioural options of farmers and their contractors [69]. Next to direct provisioning of services by the state, such as water purification via waste water treatment plants, these instruments enable or constrain particular practices of targeted populations. In the case of diffuse sources, these are, for example, the creation of new infrastructures, such as new sewage systems for glasshouses or washing places for pesticide sprayers, that intervene in possible behavioural options. Nudging, in which small adjustments of choice environments are made, might also be understood under this category.

Based on Gunningham & Sinclair [21,29], Table 1 illustrates a wide variety of policy instruments that are available for dealing with non-point source pollution. Education and information initiatives, in combination with voluntarism, can be recognised as 'information instruments.' Besides the economic and regulatory instruments, the table refers to planning instruments that modify or limit land use, which is coupled with property rights.

Based on policy practice, we see that strategies that have been successful in dealing with large point sources, such as uniform technology-based regulation, are often inappropriate and unavailable in the sphere of diffuse pollution control. One of the reasons for this is that non-point source pollution cannot be identified and measured as it leaves the property, which implies that performance standards directed at emissions are inapplicable. Further, monitoring and enforcing regulatory measures is hard because their impact is mediated by weather conditions, varies over time and is difficult to assess (particularly given time lags between emission and environmental damage).

Policy makers, therefore, have developed, on top of a vast amount of regulatory instruments (which are partly based on Basic Measures as the Nitrates Directive), a policy approach in which voluntarism and subsidies are important policy instruments to deal with the complex problem of diffuse pollution. In surveying instrument use in light of the WFD, Gouldson et al. [70] conclude that there are many reasons to suggest that alternative and complementary measures could play a key role, yet concrete evidence says that they can deliver outcomes effectively and their efficiently is lacking. However, there is also evidence [18,71] that these instruments prove to have serious shortcomings in terms of effectiveness: (a) voluntary participation may not reach the major polluters, (b) subsidy programmes effects tend to be temporary and (c) subsidy-based programmes can have

limited impact due to public budget constraints and a lack of supporting environmental regulations on diffuse pollution [18].

Table 1. Overview of policy instruments for diffuse pollution (Gunningham and Sinclair [21,29]).

Education and information initiatives
Information campaigns (government or industry associations).
Off-site training in environmental management.
On-site training in environmental management (which may be subsidized)
Information from suppliers, namely chemical companies producing pesticides and fertilizers.
Soil, manure and water monitoring.
Voluntary instruments
Industry codes of practice.
Environmental management standards.
Voluntary agreements.
Economic instruments
Input taxes or levies on nitrogen and phosphorous fertilizers, or pesticides (could be introduced on all inputs, or just those above a specific quota).
Tradeable nutrient quotas (could be based on inputs or soil concentrations) or emissions trading (between non-point and point sources or non-point and non-point source).
Subsidies for external audits and/or the adoption of best practices.
Financial compensation for setting aside land, such as the creation of buffer strips or zones.
Liability Rules, which guide compensation decisions when polluters are sued for damages.
Regulatory instruments
Compulsory adoption of environmental management plans.
Placing a cap on polluting emissions.
Controls on rates of fertilizer application.
Banning environmentally risky farm practices (for example, not leaving buffer zones to water ways and clearing vegetation near water ways).
Compulsory disposal methods of farm waste, particularly manure.
Cross compliance provisions (depending on the extent of state government subsidies).
Planning instruments
Rezoning land to exclude agriculture.
Land retirement contracts or covenants.
Land management contracts or covenants.

Based on the experience that problems of diffuse pollution could not be solved effectively, a lot of Member States are re-evaluating their choice of instruments. Because there is neither an overview of choices countries make to tackle diffuse pollution nor an evaluation of their effectiveness, this review and the forthcoming Special Issue on 'Water quality and agricultural diffuse pollution in light of the EU Water Framework Directive' from the Journal Water aims to help advance the knowledge of the (combination of) instruments. The country-specific information on the implementation of the WFD and related agricultural diffuse pollution policies will provide interesting information on good practices and policy successes (if any).

4. Conclusions

The European Water Framework Directive is an ambitious environmental programme in terms of its aims: improving water quality and the ecology of water bodies all over Europe and its principles of environmental policy. It is perhaps even more ambitious to achieve these goals in a framework that creates great dependence on neighbouring policy fields, such as agriculture, nature, industry or spatial planning.

As we have highlighted in this review article, diffuse pollution of nutrients and pesticides is one of the environmental issues where the reality of implementation practices of the WFD, as far as we could see, show limited room to directly intervene in causes of pollution, while implementing agents

are incentivised to look for ways of collaboration in a fragmented policy environment. The nature of the matter is such that the work must be carried out under (knowledge) uncertainty, which implies that there is a strongly felt need for 'room for experimentation.' However, when knowledge is mobilised in these experimental settings to legitimate more restrictive policies, controversies loom, paralyzing the development of environmental policies that have the potential to be more effective. At the same time, time is running out as we will soon arrive at the third round of river basin planning (2021–2027). Accelerating goal attainment will be in conflict with the interests of important stakeholders, which for a large part are vulnerable groups such as farmers that already deal with the pressure of balancing environmental demands with economic interests. In that context, no easy solutions for effectively dealing with diffuse pollution in water systems are likely to be found.

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