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Ready for the "water turnaround"?

The German Government's National Water Strategy

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- On 15 March 2023, the German Federal Cabinet adopted the National Water Strategy. In view of the consequences of climate change, the Federal Government intends to initiate a "Wasserwende", or "water turnaround", by focusing on ten strategic issues to accelerate the transformation of the water sector.
- The National Water Strategy's comprehensive, interministerial approach and its action programme, spanning almost 80 measures, are commendable. Nevertheless, it marks only the beginning of a transformation process leading to the target date of 2050.
- Key questions regarding priorities, accountability, funding, the implementation timetable, and oversight of the strategy remain vague and are in need of prompt, solution-oriented clarifications.
- All relevant stakeholders – especially the federal states (Länder) and local authorities – must be involved in the implementation of the strategy if the objectives are to be achieved.

List of Contents

"Water is the messenger delivering the bad news of climate change".[1]

Whether it is heat, drought, wildfires, or low river levels in Europe (especially those of the Rhine in the summer of 2022), the catastrophic flooding in the Ahr valley in July 2021, large-scale fish deaths, or the establishment of the Tesla factory in Brandenburg with its water-intensive production facilities, the challenges we face with water as a resource are becoming increasingly apparent.

Recent scientific findings have indicated that groundwater resources in large parts of Europe have been dwindling since the beginning of the 21st century, mainly due to excessive extraction for use in the supply of public water, as well as for agricultural and industrial production.[2]

Throughout the world, the demand for water is increasing and, at the same time, so is the inequality in its distribution. This inequality leads to the spread of illness and disease, increased migration, and sometimes even political conflicts. These challenges, which mark the UN's Water Actions Decade from 2018 to 2028, will be addressed on World Water Day (22 March 2023) at the UN Water Conference in New York. The management of water resources demands that we think in broader time frames[3], beyond our own national borders.

Here in Germany, conflicts of distribution and use are emerging between urban and rural areas during the hot, dry summer months. Up to now, these battles have been fought out by local politicians since the provision of water forms an essential part of public services at the municipal level. Environmental organisations have also highlighted the issue of water as one of their concerns. But as yet there is no legally defined prioritisation to deal with water shortages.[4]

Could this potentially endanger social cohesion in the medium term in a densely populated industrialised country like Germany? Particularly in the context of inflation, concerns about energy security and costs, as well as the war on our doorstep, almost three years of the covid pandemic and the other effects of climate change.

It is against this background that the Federal Government adopted a National Water Strategy containing ten strategic themes, challenges, and visions for 2050, as well as targets and measures by cabinet resolution on 15 March 2023.[5] According to Federal Environment Minister Steffi Lemke, this strategy represents a response to the consequences of climate change. The objective is to initiate the water turnaround[6] and to provide anticipatory responses as to how the water supply for both people and the environment can be secured in a sufficient quantity and in the necessary quality by the year 2050. Its foundations are the coalition agreement of the traffic light coalition government, the outcomes of a multi-year national water dialogue involving experts from water management, agriculture, and other economic sectors, research, associations, the federal states and municipalities, as well as the national citizens' dialogue "Water". A large part of the process had already taken place under the CDU/CSU-led grand coalition with the SPD. The Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) has the overall lead.

The topics covered span from raising awareness of water as a global resource to natural water management and risks from the input of substances, climate-adapted further development of water infrastructures, energy and material cycle issues, and the efficiency of administrative bodies. The strategy is flanked by a comprehensive programme of almost 80 measures to transform the water sector into a more sustainable one.

During a consultation process, the federal states and their associations had the opportunity to make suggestions and comments on the draft of the National Water Strategy. While the strategy has been welcomed in principle, the main points of criticism centre on questions of implementation, in particular a lack of specificity about responsibilities, financial resources, and timelines, as well as a deficit in the prioritisation of measures, insufficient monitoring, and unclear data accessibility. Furthermore, the requirement for people to carry out the implementation is highlighted, in view of the partially precarious resources at the disposal of the responsible administrations.

The following section provides some examples of the challenges that lie ahead.

Water conflicts between urban and rural areas

The National Water Strategy is designed to prevent water scarcity and thus distribution conflicts, including those between densely populated metropolitan areas with high water demand and rural areas where demand is lower and the water supply is more abundant.[7] In cases where such conflicts nevertheless arise, a clear hierarchy of water use criteria needs to be established. The preparation of a nationwide guideline on how to proceed in cases of regional water scarcity has already begun, according to Federal Environment Minister Steffi Lemke. This kind of uniform orientation framework for local or regional prioritisation decisions is intended to assist the responsible authorities in deciding who may use water as a priority in the event of a shortage, to ensure that sufficient resources, as close as possible to the location, are available for drinking water supply at all times.[8]

Responsibilities for water legislation and water management issues lie partly with the federal states and municipalities. It is therefore appropriate that the National Water Strategy includes numerous overarching issues relating to water management, such as digitalisation, accelerated planning and inter-municipal cooperation. This includes issues that have time and again - and not only in the context of water management - been both a relevant and protracted task for legislators at the federal and state levels, and which have contributed to shaping their relationship.

One water management measure that can prevent water shortages is the infiltration of rainwater. As such, the notion of the "sponge city" with its urban architecture that favours the percolation of water into the ground is shifting into the strategy's focus. Roughly 45% of the urban and transportation areas in Germany are already considered sealed. Large amounts of rainwater are channelled into the sewers and do not contribute to the regeneration of groundwater. Roughly 54 hectares of undeveloped land are converted into transport and urban settlement areas every day. The German Sustainability Strategy (DNS) has set the target of reducing land consumption to fewer than 30 hectares per day by 2030, though this target was already previously drawn up for 2020 and had to be amended out of necessity.[9] The objectives of the DNS therefore correlate with those of the National Water Strategy with regard to the reduction of soil sealing and the unsealing of already sealed areas. An interlinking of the National Water Strategy with other national strategies launched by the Federal Government is also explicitly mentioned in the draft strategy.[10]

Water-sensitive urban development impacts on urban planning and the reorganisation of existing infrastructure, as both appropriate planning capacities and financial resources are needed. Five key requirements for this would be: 1) Eliminate obstacles in the planning process; 2) Promote a nature-oriented and technical conception and design of the measures; 3) Examine the legal framework; 4) Create funding and financing opportunities; 5) Overcome other obstacles in implementation, e.g., by empowering stakeholder groups.[11]

Intensified co-operation and co-ordination of regional administrations, as well as advisory services and specialist expertise for the municipal level, or possibilities for exchange via internet portals and their networking functions, are mentioned as possible solutions. However, these are all proposals that remain vague when it comes to implementation. This is also true for the action plan: inter-municipal collaboration needs to be further developed, the necessary personnel requirements need to be identified, and a water data strategy needs to be conceptualised. All these tasks form part of the short-term measures that are to be initiated in the next five years, and at present are without a clear target date. The numerous actions that are listed are only briefly outlined. They are categorised into short- to medium-term actions, which only indicate when they should start – either within the next five years or in the second half of the decade.[12] This means that the only target date for the overall strategy is 2050 – which is too vague, especially with regard to the individual action to be taken, some of which are designed to build on each other.

It is positive that the National Water Strategy considers the issues and areas in relation to each other to prevent distribution conflicts between urban and rural areas as well as between users in urban and rural areas. The Federal Ministry for the Environment has plans to conduct joint evaluations with the federal states to determine where interconnected networks and long-distance pipelines could be used to bring water from wetter areas to drier areas of the country, thus balancing out regional imbalances in water availability.[13]

Either way, in the event of conflicts, the clarification and establishment of clear priorities (water use hierarchy) is urgently needed where there are water shortages. In this regard, the Water Action Programme lists the development of rules and criteria as a short-term measure (starting within five years).[14] Two of the only priorities that have already been identified are the supply of drinking water to the population and ecological water needs, although the latter still requires a more precise definition. Since so many other measures to prevent water scarcity and conflicts of use depend on this, e.g., decisions on the location of future industrial settlements, this process must not only commence as soon as possible, but should also be concluded well before 2050.

Water as a resource in the energy world of tomorrow

The availability and distribution of water also play a major role in the energy sector. It is no coincidence that one of the ten strategic themes is entitled "Connecting water, energy and material cycles". Almost half of the water abstraction in Germany (44.2%) is related to energy supply. While 70% of the water extracted for public supply is ground water and spring water, most of the water extracted for energy supply is cooling water from rivers that is fed into power plants. Logically, the risk that climate change-related low water periods pose to energy supply security is also addressed.

As recently as last August, the persistent drought severely hampered inland navigation on the Rhine. Consequently, fundamentally important coal-fired power plants feared for their fuel supply.[15]

While it is undoubtedly plausible to assume that less water will be needed to cool fossil-fuel power plants in the future, the strategy neglects to consider the fact that even low-CO_2 technologies for energy production and storage consume enormous amounts of water. Photovoltaic power plants, for instance, also frequently must be cooled and cleaned with water. Water is the raw material in the production of hydrogen, of which approximately 9 litres are needed per kilogramme of hydrogen[16]. The extraction of lithium as an indispensable raw material for e-car batteries, for example, has a very diverse water consumption pattern depending on the type of extraction, but in the process that currently dominates and involves the evaporation of saline brine, consumption is very high. This means that it must be assumed that between 2,000 and 10,000 litres of water are consumed per electric car battery, which houses approximately 10 kilogrammes of lithium.[17]

By 2030, the German government calculates that hydrogen demand will reach around 90 to 110 terawatt hours (TWh). The National Hydrogen Strategy states that domestic generation plants with a total capacity of up to 5 gigawatts (GW) are to be built by 2030 in order to cover part of this demand themselves.[18] While hydrogen is already used in petrochemical processes as well as in the synthesis of basic materials, it could soon also be used in new fields as an "energy carrier of the future", such as for the production of steel by means of H_2 direct reduction. It is becoming clear that water as a resource will also play a decisive role in the climate-neutral energy system of the future if we are to drive forward the decarbonisation of industry and, possibly, of the heating sector and parts of the transport sector. This is especially true in regions of the world threatened by water scarcity that possess ideal conditions for the production of green hydrogen from surplus renewable solar electricity (e.g., North Africa) or large quantities of lithium deposits (e.g., South America).

The ambitious plans to build up H_2 production capacities in water-poor regions such as the Iberian Peninsula, North Africa or the Arabian Peninsula should not be viewed in a completely uncritical way, or by ignoring the enormous water requirements that hydrogen electrolysis entails. Even though the use of seawater desalination plants is an option for production sites near the coast, this inevitably further increases the costs of this already comparatively expensive energy carrier. One approach to a solution, is to integrate this intermediate desalination step into the new value chains in order to avoid any adverse effects on local water supply and any conflicts with regard to the security of drinking water supply. Germany and the EU could also limit the amounts of freshwater used for hydrogen electrolysis with regulatory provisions, but this would bring with it risks to the rapid ramp-up of the technology. The alternative is the hope for a technological breakthrough that could make it possible to split salt water directly into hydrogen and oxygen without intermediate steps, at some point in the future.[19]

The import of hydrogen and the supply of lithium for battery cell production are essential components of Germany's energy transition, especially in the industrial and transport sectors. Through research and the provision of more efficient technologies such as the utilisation of wastewater and storage options practised in Germany, as well as electrolysis and lithium extraction processes that save as much freshwater as possible, Germany has the potential to live up to its responsibilities internationally as well.

Pharmaceutical residues in water as a societal task

Alongside water availability and consumption, the pollution of water bodies resulting from the input of substances is also an environmental policy challenge that should be limited. Accordingly, the key points of the National Water Strategy address the issue of so-called trace substances or residues originating from pharmaceuticals, cosmetics, and detergents in water and water bodies. Nevertheless, the points made here are relatively light on detail. The BMUV (Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection), refers here, on the one hand, to the role of the Federal Environment Agency's Trace Substances Centre, which is to develop measures and provide information on the risks. One the other hand, an improvement in the treatment of wastewater by adding a fourth purification stage is also cited. An additional "Water Communication Strategy" will also be used to emphasise the value of clean drinking water.

As things stand, wastewater is largely treated in three stages (mechanical, biological and chemical processes), although so-called trace substances still remain despite these processes. While the consequences of pharmaceutical residues in water (especially long-term effects) are disputed, antibiotic resistance and fertility problems can arise.[20] This is because active pharmaceutical ingredients are often not easily degradable. The human body excretes many substances unaltered, so that every year many tonnes of the active substances found in human medicines and their degradation products are released into the environment with the wastewater via sewage treatment plants.[21] While a fourth purification stage, which is currently undergoing testing in a number of pilot projects, is intended to remove these trace substances, there is no legal obligation to do so as yet. Similarly, the question of the bearing of the associated costs in the event of a further purification stage is not settled.[22]

The National Water Strategy refers here to "producer responsibility, [and the development of] polluter-pays financing models". The EU Commission's legislative proposal on the Waste Water Ordinance also addresses the issue of extended producer responsibility, which is to oblige member states to implement it nationally.[23] The recommendation provides for a mandatory introduction of this purification stage (staggered according to the size of the urban area) by 2035 or 2040.

The one-sided emphasis on additional purification stages being the solution for the removal of trace substances from water distracts from addressing the proper treatment and disposal of pharmaceuticals or chemicals, and thereby taking the whole process into account. The National Water Strategy does address "reduction measures along the value and use chain". For the moment, however, only the continuation of the dialogue on trace substances is required here. Though it is estimated that only about 10% of pharmaceutical residues found in water are due to the incorrect disposal of medicines, using medicines responsibly can make an important contribution. This could start with a modification and adaptation of prescribing practices by the attending practitioner (e.g., fewer prescriptions of antibiotics).[24]

Particularly in view of the demographic transition within the population, an increase in the consumption of pharmaceuticals is to be expected. This, in turn, is likely to lead to a higher environmental impact due to pharmaceutical residues.[25] Specific points should then be addressed and implemented so that co-operation with physicians, pharmacists and health insurance companies can be intensified in the dialogue on trace substances. These reach patients in a low-threshold way and can help foster understanding in the use of medicines.

Wastewater surveillance - early detection of health hazards

In the draft National Water Strategy, the sequencing of wastewater samples is addressed beyond the post-covid pandemic period. Indeed, by analysing wastewater to determine the concentration of the virus, it is possible to make early predictions about the development of a pandemic or about waterborne pathogens in general. For example, if and which coronavirus infections are increasing or decreasing in the population of a certain area.[26] A continuous wastewater monitoring system would allow countermeasures (booster shots, warnings) to be implemented immediately in order to control the incidence of infection by way of an improved and more efficient early warning system. Of course, this would not eliminate the importance of testing and laboratory sampling, but it would provide a more complete picture of the prevailing infection situation.

In light of the successful pilot projects in some German federal states and the experiences of our European neighbours (Belgium, Luxembourg, Spain, the Netherlands), where the monitoring of wastewater is now a common and regular practice, such a scheme should also be promoted and expanded in Germany. In metropolitan areas, where a virus can spread rapidly, wastewater monitoring can offer great advantages.[27]

It is imperative that the European perspective be more strongly reflected in the implementation of the National Water Strategy (e.g., EU-wide data exchange, development of a coordinating structure among the competent authorities, incorporation of the experiences of EU Member States). Fundamental to this is the Commission's proposal to revise the Urban Wastewater Directive, published on 26 October 2022: e.g., antibiotic resistance in sewage treatment plants is to be investigated for all settlement zones with more than 100,000 inhabitants from 2025 onwards.[28]

With respect to antibiotic resistance and circulating viruses in water in particular, the Federal Ministry of Health's plan, under which 18.7 million euros will be allocated to the planned expansion of wastewater monitoring in 2023, could represent an important, further building block for public health.[29]

Agriculture - multifaceted challenges due to substance inputs and water consumption

Unsurprisingly, agriculture is also identified as a critical sector in the National Water Strategy: the inflows of phosphorus and nitrogen into our water resources constitute a burden for the aquatic environment. The impacts are detectable in 77% of surface water bodies and in 29% of groundwater bodies.[30] Concurrently, the agricultural surplus of nitrogen has declined by almost 20% already in the five-year moving average over the period from 1992 to 2016. [31] Despite this, achieving further reductions in nitrogen outputs is imperative to improve nutrient efficiency and prevent nutrient surpluses.

The EU Biodiversity Strategy, which has been mentioned several times, provides an adequate tool for this. The Federal Nutrient Management Programme established as part of the Agricultural Strategy 2035 also supports a wide range of models and demonstrative projects that are dedicated to this goal.[32]

A more nuanced picture emerges when looking at water consumption. In Germany, growing conditions are optimal, with an average of between 700 and 800 litres of precipitation per square metre per year - sufficient for growing crops such as cereals, maize, or potatoes. In 2019, the water withdrawn by German agriculture therefore also amounted to only 2.2% of total water withdrawals.[33] The National Water Strategy also identifies this causal relationship, but correctly points out that the need for irrigation has increased significantly in recent years due to climate change.[34] However, it is more telling to compare the origin of the water used, i.e., to distinguish between green water (rainwater) and blue water (water from groundwater and surface water). In Germany, around 99% of rainwater is used for agriculture.[35] This supports sustainable water extraction and sets Germany apart from many developing and emerging countries that rely on groundwater and surface water for their agricultural sector.

A positive aspect is the Strategy's commitment to focus on the provision of water as a public service and to take responsibility for ensuring that water users - such as agriculture - are guaranteed an adequate, affordable and efficient water supply.[36] The Strategy also assures that industrial and agricultural needs will be taken into account when it comes to balancing water withdrawals.[37] What this actually entails in more specific terms, however, remains an open question. The National Water Strategy advocates education, training and support programmes, as well as incentive schemes, to achieve soil and water-compatible agriculture.[38] While incentive systems in particular represent an important lever for greater sustainability, they are only mentioned in passing. For the implementation of effective environmental protection, the need for regulatory action is often unavoidable. Still though, it is imperative to continue to create incentives instead of relying solely on bans and stricter legislation.

Furthermore, the importance of sustainable agriculture is emphasised and reference is made to agro-ecological approaches that can help to reduce the strain on natural resources.[39] The transition of the agricultural sector towards more sustainability and resilience will be one of the biggest challenges in the coming years. The drought period in 2018 led to huge grain losses in German agriculture. Crop losses in Schleswig-Holstein, for example, amounted to 31%, and in Brandenburg to 27%.[40] Not all approaches listed are compatible with agricultural structures in Germany. It would be more beneficial if concrete measures were identified. One example would be the expansion of agro-forestry systems, which, due to the root systems of the trees, help to reduce nitrogen inputs into groundwater and surface waters. This also improves soil fertility, so that less fertiliser is needed.[41]

From an environmental and climate policy perspective, the rewetting of peatlands and wetlands is indisputably a sensible measure. The National Water Strategy does not mention, however, that the use of peatlands for food production has long been subsidised by the state and that farmers could lose land. In all the measures that are being called for, it is necessary to strive for a balanced approach between environmental protection and the economic interests at stake - sustainability must not only be thought of in ecological terms, but also in economic and social terms. The absence of an impact assessment is exemplified by the designation of nature conservation areas. With reference to the EU Biodiversity Strategy, no exact definition of protected areas has been given, nor have the costs been calculated.

Moreover, approaches for technological solutions, which are essential for lower water consumption, and a reduction of substance discharges into water bodies, are only dealt with peripherally. The potential of digitalisation and agricultural irrigation techniques are addressed in a rather vague way.[42] New genomic techniques (NGT), which can be used to breed crops that require less water and less fertiliser and pesticide, are at no point mentioned as a solution. Technological solutions will be the crucial building blocks for balancing the conflicting aims of increased environmental protection (less water and land consumption, reduction of plant and fertiliser use) and increasing demand for food (growing world population and increased consumption).

The planned involvement of representatives of professions in an interdisciplinary process that proposes practice-oriented solutions and management methods is to be welcomed in principle.[43] Furthermore, agriculture is to be involved in the development of regional water concepts[44] and in participatory forums[45]. It is though questionable to the extent to which there are not already existing structures (e.g., the Future Commission for Agriculture) that can be linked to the organisation of these processes and participatory forums.

In the interests of sustainable development, Germany should place an emphasis on agricultural production, as the climatic advantages of its location and favourable production conditions lead to lower water consumption. As a result, international agricultural trade, and with it a strong German agricultural sector, can actively contribute to conserving water. This is an aspect that is lacking in the National Water Strategy. Although it calls on farmers to take responsibility, it does not emphasise clearly enough the important contribution they can make to solving the problem.

Looking beyond our national borders: water knows no boundaries

While direct, daily water consumption in Germany is around 130 litres per person, the daily water footprint here amounts to 3,900 litres per person.[46] To determine the water footprint, in addition to direct consumption, indirect or so-called virtual water consumption is also measured, which indicates how much water is actually consumed and polluted through the consumption of food and industrial products.[47] The virtual water footprint also distinguishes between internal and external water consumption. Only 14% of the national water footprint originates in Germany, 86% comes from abroad. In comparison: in the United States, the ratio is 80% to 20%, in Brazil 91% to 9%, and in China 90% of the water used comes from domestic sources while 10% is imported. This makes Germany a net importer of virtual water, while other countries, especially in South America and South and South East Asia, are net exporters.

The bulk of Germany's external water consumption is attributable to the import of agricultural goods, especially from Brazil, the Ivory Coast and France. Importing large amounts of virtual water is less problematic, if for example, predominantly green water is used for cultivation or, when blue water is used, the local water supply of the producing country is not over-exploited.[48] In some cases, however, water-intensive agricultural goods are imported from emerging and developing nations suffering from water scarcity, whose agricultural sectors use blue water as well as green water and contribute to water pollution through the intensive use of e.g., fertilisers, pesticides and antibiotics.[49] The main contributors to the unsustainable use of blue water in global agriculture are cereals, rice, cotton, sugar cane, and animal feed.

Ultimately, water scarcity and pollution have an impact on many areas of life and therefore also on the achievement of the goals of the 2030 Agenda. Particularly when looking at SDG 12 (Responsible consumption and production), it becomes very clear that, in addition to the national perspective, the international perspective also has a central role to play.

While in Europe 24% of freshwater withdrawals are used for agriculture, the global average is 70% and in some developing countries as much as 90%.[50] Large quantities of water are already needed for agriculture in developing countries and, due to global population growth, demand is expected to increase by a further 55% by 2050. Reducing (blue) water use and pollution in the production of agricultural goods is important to conserve global water resources, especially in those countries of the Global South that suffer from water scarcity.

The National Water Strategy should therefore recognise Germany's shared responsibility for the use of water resources in producing countries and seek to address these challenges. A multi-level effort that links the national with the European and international levels would be a helpful course of action to take. To achieve this, consumers in Germany need to be more conscious of their own virtual water footprint and the potential impact this may have on water resources in producing countries. The new National Water Strategy therefore rightly calls for transparency (appropriate product labelling) - ideally, these would not only display the water footprint, but also indicate whether the goods have been produced sustainably with regard to local water resources.

In addition, a debate should be initiated at the German and European level on how to reduce the import of agricultural products originating from producing countries where cultivation leads to an overuse of water resources. While there is evidence of an awareness of this, the National Water Strategy lacks concrete proposals to remedy the situation. In the context of food supply chains, for example, the question arises as to what contribution the German Supply Chain Due Diligence Act (which came into force in January 2023) might make in this regard and to what extent the Corporate Sustainability Due Diligence Directive proposed by the Commission could also have a supporting effect in the future.[51] For better integration, reference should be made to existing instruments and further solutions should be developed to support agricultural imports with sustainable water use.[52] There is also a need to research and implement technologies to reduce water use and pollution in agriculture, especially with a view to emerging and developing countries suffering from water scarcity (e.g., through new genomic techniques, smart farming methods[53]). This requires suitable mechanisms to promote Innovation for research institutions, start-ups and companies, both in the Global South and for German stakeholders who want to or already operate internationally.

It is certainly understandable that the new National Water Strategy focuses on the management of water resources within Germany’s borders. In light of the 17 Sustainable Development Goals (SDGs) of the globally applicable 2030 Agenda, it is however equally necessary to look beyond Germany’s border, to focus on international cooperation and to place an emphasis on aligning the strategy with the international structures governing water policy.

Ready for the "water turnaround"? - set the course and set sail!

"Water is the basis of all life." This is the first sentence of the German Government's National Water Strategy. The usefulness of a strategic and integrative approach to protect it and manage shortages is beyond question. Similarly, evident is the urgency with which the challenges need to be addressed. Nevertheless, the references to time-consuming planning and implementation periods for infrastructure projects, and the lengthy periods of time required for measures to become effective are no more than an expression of the growing awareness of the problem. Given the discernible gaps in the planned implementation of the action programme, the question of how the goals set out in the strategy are to be realised by 2050 remains open and requires urgent answers.

Where do the priorities actually lie if the action programme only makes a rough distinction between short-term measures (starting within the next five years) and medium-term measures (starting from the second half of the decade up to 2030)? Another open question is how to resolve the conflicts of use and where the responsibility falls. Also securing funding for the measures and the ultimate accountability for the funds remains an open area of concern - especially since much of this also falls under the jurisdiction of the federal states and municipalities.

So, in these times of tight budgets and insufficient human resources at administrative bodies and municipal institutions, are these measures even feasible? Digitisation could be the remedy here. However, this assumes that the potential of technological and social innovations is actually exploited, and that sufficient usable data is available on the basis from which action can be taken. One question that also must be asked is just how the outcomes be reviewed and their impact tracked so that timely readjustments can be made if needed.

The National Water Strategy can only be the beginning of a process and certainly not the end. In the version adopted by the Federal Cabinet, the strategy is consequently also referred to as an orientation framework for supplementary strategies and concepts of the federal states that are adapted to regional conditions. For the implementation, more coordination and agreement on priorities, responsibilities and the relevant financing are therefore necessary.

The strategy can certainly focus the attention of the various actors in the water sector, as well as the population, on the importance of water as a resource, and raise awareness of its value and vulnerability. It evolved from a multi-year process of dialogue involving participants from the water sector, science, agriculture, research, and interest groups, as well as interested members of the public.

Although this approach is to be continued in the National Water Strategy, it remains unclear how these processes and participation forms will be designed.

For the coordination of measures and for practice-oriented solutions, existing structures should be used first. The draft states that an inter-ministerial working group is to be set up with the participation of the federal states, which is to present a report on the implementation of the strategy every six years.

A co-ordinated approach across ministries and federal states is undoubtedly to be welcomed. Nevertheless, the gap between the reports on implementation seems far too long and it is unclear when the six-year period starts to run. If the first report were to be delivered only six years after the introduction of all the measures in the action plan, this would happen in 2036 and mean that only three implementation reports would be produced by the target date of the strategy in 2050. Any need for adjustment in the implementation can significantly advance the achievement of the goals. In addition, yearly inter-departmental progress reports to the German Bundestag would seem appropriate to be able to ensure that measures can be readjusted, if necessary.

Given the worrying challenges and the vital importance of water as a global resource - especially in the context of food security, health care and the energy transition - time is running out to address the deficits mentioned above so that the actions set out in the strategy can have their full intended effect.

Water is a global resource. Consumption does not only have an impact locally, but also beyond the virtual water footprint in other, even more vulnerable parts of the world. This also applies to the low-CO_2 technologies for energy generation and storage, some of which are used in water-scarce regions of the world.

It is important to keep an eye on developments at the EU level during the implementation of the National Water Strategy, and also data exchange, the establishment of coordination structures, or simply with regard to the sharing of information and experience between member states.

With this year's United Nations World Water Day on March 22nd taking place under the slogan "Accelerating Change", it is not only calling for an acceleration and intensification of efforts to achieve sustainable water use at the international level, but also at the national level. With the adoption of the National Water Strategy, the Federal Government is embarking on a water turnaround. For a real turnaround, however, the course and the sails need to be set even more precisely.

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1 Jay Famiglietti, hydrologist, director of the Global Institute for Water Security, University of Saskatchewan, Canada.

2 National Geographic Newsletter, 6 December 2022: Europe's water crisis is much worse than we thought | National Geographic [Last accessed: 10 March 2022].

3 Motion of the CDU/CSU parliamentary group in the German Bundestag, printed document 20/5351, Jan. 24, 2023, "Nationale Wasserstrategie – Lösungsorientiert, nachhaltig und kooperativ umsetzen" [Last accessed: 11 March 2023].

4 FAZ 10.08.22, “Wassermangel – Wer muss verzichten?” [Last accessed: 10 March 2023].

5 National Water Strategy: Cabinet decision of March 15, 2023 (bmuv.de) [Last accessed: 15 March 2023]. The contribution at hand is essentially based on the draft version of the National Water Strategy dated 25 November 2022. For better readability, the term ""Water Strategy"" will be used in the following.

6 BMUV press release dated on 15 March, 2023, Bundesregierung legt Grundstein für modernes Wassermanagement | Press release | BMUV [Last accessed: 16 March 2023].

7 Such conflicts became apparent in the past summer drought in Hesse, for example, where water is pumped from the Vogelsberg district to Frankfurt: Dürre: Wer muss bei Wasserknappheit als erstes verzichten? (faz.net) [Last accessed: 15 March 2023].

8 Vorkehrungen gegen Notstand: Bundesregierung beschließt Nationale Wasserstrategie - n-tv.de [Last accessed: 15 March 2023].

9 Cf. Federal Environmental Agency: [https://www.umweltbundesamt.de/daten/flaeche-boden-land-oekosysteme/flaeche/siedlungs-verkehrsflaeche#-das-tempo-des-flachen-neuverbrauchs-geht-zuruck [Last accessed: 9 January 2023].

10 Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (2022): National Water Strategy - draft dated 25 November 2022 Regierungsentwurf Nationale Wasserstrategie | Download | BMUV: 110 [Last accessed: 13 March 2023].

11 Cf. BMUV: https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Binnengewaesser/langfassung_wasserstrategie_bf.pdf, p.36 [Last accessed: 9 January 2023].

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