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Freshwater as a global commons: International governance and the role of Germany

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German Development
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Discussion Paper

15/2019

Freshwater as a Global Commons

International Governance and the Role of Germany

*Elke Herrfahrdt-Pähle
Waltina Scheumann
Annabelle Houdret
Ines Dombrowsky*

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Contents

Acknowledgements

Abbreviations

Executive Summary	1
1 Introduction	3
2 Challenges and importance of water resources in light of global sustainability	4
2.1 Local and regional aspects of sustainable water use	5
2.2 Global challenges of sustainable water use	6
2.3 Freshwater resources as a global commons?	7
3 Global water governance: Taking stock of a fragmented architecture	10
3.1 International norms	11
3.1.1 Regimes on transboundary waters	12
3.1.2 Norm-based global water institutions	14
3.2 International targets	15
3.2.1 The Sustainable Development Goals	15
3.2.2 A planetary boundary as a limit to global water use	17
3.3 Paradigms: River basin management and Integrated Water Resources Management (IWRM)	18
3.4 Central actors: Roles and responsibilities	19
3.4.1 UN-Water	20
3.4.2 High-level political bodies	21
3.4.3 International platforms and conferences	22
3.4.4 Private sector initiatives	23
3.5 Gaps and demand for regulation	24
4 The role and contribution of Germany	26
4.1 Contributions by Germany	27
4.2 Contributions with Germany	29
5 Transformation processes	30
5.1 Short-term options	31
5.2 Medium-term options	32
5.3 Long-term options	33
6 Conclusion	34
References	38

Figures

Figure 1: Interactions between the global and the local level	6
Figure 2: Mapping the fragmentation of global water governance...	11
Figure 3: Interlinkages of SDG 6 with other SDGs	16

Tables

Table 1: List of interviews	4
Table 2: General classification of goods	7
Table 3: Regime-relevant attributes of global environmental problems	10

Abbreviations

BMBF	German Ministry of Education and Research
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMZ	Federal Ministry for Economic Cooperation and Development
CANZ	Canada, Australia and New Zealand
CBD	Convention on Biological Diversity
CFS	Committee on World Food Security
CSD	Commission on Sustainable Development
ECOSOC	United Nations Economic and Social Council
G77	Group of 77 – a coalition of 134 developing nations
GEMI	Monitoring Initiative on water-related SDGs
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GROW	Water as a Global Resource
GWP	Global Water Partnership
GWSP	Global Water Systems Project
ILA	International Law Association
HLPF	High Level Political Forum
HLPW	High Level Panel on Water
IRN	International Rivers Network
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
KfW	Kreditanstalt für Wiederaufbau
RBM	River Basin Management
RBO	River Basin Organisation
SADC	Southern African Development Community
SDG	Sustainable Development Goal
SIWI	Stockholm International Water Institute
SuSanaA	Sustainable Sanitation Alliance
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNSGAB	United Nations Secretary General's Advisory Board on Water and Sanitation
WASH	Water, sanitation and hygiene
WFD	Water Framework Directive
WIN	Water Integrity Network
WWC	World Water Council
WWF	World Wide Fund for Nature

Executive Summary

Water is essential for all life on earth and human welfare. Essential functions of the resource include not only fulfilling the human need for drinking water, but also for sanitation, food production, industrial processes and electricity generation. The resource also supports ecosystems and ecosystem services and is a key prerequisite for attaining many of the Sustainable Development Goals (SDGs). Many countries, however, suffer from some or all of the following: physical water scarcity, a lack of access to a safe water supply and sanitation, water pollution and hydrological extremes (droughts and floods) due to climate change. The generality and severity of water problems lead many to speak of a global water crisis.

While this crisis mostly manifests at the local or in some cases transboundary level, two global issues are often overlooked. First, global trends such as climate change, population growth and the spread of water-intensive consumption and trade patterns are key triggers that cannot be addressed at the local level alone. Second, the aggregation of local or regional water problems may reach global dimensions when local phenomena add up to a universal threat to sustainable development. For decades, freshwater resources have mainly been governed at the local and sometimes transboundary level. However, in the face of current challenges the question arises whether (fresh) water should be conceptualised as a global common good, and how global water governance could contribute to improving its protection.

This study reveals that the current global water governance architecture is a highly fragmented and incoherent regime consisting of numerous norms, paradigms and actors, each covering single aspects of global water governance. Given the diversity of issues, a “classical” formation of one comprehensive international water regime in the form of a framework convention, and equipped with a specific global governance institution (such as for climate stability, biological diversity or the prevention of desertification) has so far not emerged.

The authors suggest a global water governance regime that could evolve from the improved interplay of the existing (and potentially improved) elements of global water governance (i.e. norms, targets, paradigms and actors). This could be complemented by two innovations at UN level, installing an Intergovernmental Body on Water allowing for mandated decisions on water in the UN system and a Scientific and Practice Panel on Water improving the science-policy interface on water. Such an approach that combines global norms and joint guidelines to be adapted to local contexts and needs may be able to increase urgently needed political support for governing water as a global commons, beyond the nation-state interests and their perception of water resources as sovereign goods.

1 Introduction

Are freshwater resources a global common good, and does their protection require a global governance regime? Water resources are essential for all life on Earth in general and for human welfare in particular: access to sufficient water of good quality is essential for human life and livelihoods; drinking and sanitation water needs, food production, industrial processes and electricity production all depend on the availability of water resources. Freshwater supports diverse ecosystems, such as wetlands, forests and estuaries, and provides a number of important ecosystem services, such as water provisioning, cultural (e.g. recreational activities and religious significance) and supporting services (e.g. nutrient cycling, water cycling) (MEA, 2005).

On average, global water resources are enough to satisfy the needs of both humans and the environment (OECD, 2011). However, many regions suffer from physical water scarcity, economic water scarcity due to under-investment in the development and distribution of water resources, water pollution and increasing hydrological extremes. Poor water governance is an additional, crosscutting challenge (OECD, 2011). The deterioration and overuse of freshwater resources has a number of impacts on economies and livelihoods, such as reduced soil moisture and thus biomass production, reduced water supply for humans and nature, and reduced climate regulation due to impacts on vapour flows (Rockström et al., 2009).

Water problems are often perceived to be local, or in some cases transboundary. However, it is often overlooked that they are also triggered by global trends such as climate change and the spreading of water-intensive consumption and trade patterns. In addition, the generality and severity of these local and regional problems leads many to speak of a global, universal water crisis (Cosgrove & Rijsberman, 2000; Mekonnen & Hoekstra, 2016). The reason is that the aggregation of local or regional water problems may reach global dimensions: if water bodies as life-supporting ecosystems deteriorate at large scales across the globe, these local phenomena add up to a global (universal) threat to sustainable development. The universality of water problems and their essential role for economies and human well-being have motivated some scholars to term freshwater resources as a global commons (Nakicenovic, Rockström, Gaffney, & Zimm, 2016). In doing so, they are referring to the functions performed by water resources, rather than to water as an entity.

Global drivers of local and regional water problems, their widespread universality and the potential global effects of the aggregation of local water problems, raise the key question whether (fresh) water should be conceptualised as a global common good and, if yes, how global water governance can contribute to improving the protection of this global common good. Global water governance can be defined as “the development and implementation of norms, principles, rules, incentives, informative tools, and infrastructure to promote a change in the behaviour of actors at the global level in the area of water governance” (Pahl-Wostl, Gupta, & Petry, 2008).

The present study argues that sustainable water management requires local and regional approaches that (a) build on global norms, targets, paradigms and actors, and (b) take into account global drivers and effects of water resources availability and use. The authors scrutinise the need for such an approach, take stock of the existing norm-based and institutional basis, and identify crucial transformation processes towards this goal, including the (potential) role of Germany.

The study scrutinises the appropriateness of conceptualising (fresh) water as a global common good and subsequently explores the potential for improved global water governance. In Section 2 we ask in which sense the global level is relevant and necessary for effective water governance and explore the notion of water as a global commons. Section 3 maps the global water governance architecture, while Section 4 focuses on the role of Germany in this sphere. Section 5 explores how the global water governance architecture can be strengthened and transformed, and Section 6 concludes and points to further research needs.

The study is mainly based on an extensive review of the literature on global water governance, water as a (global) common good and challenges for sustainable water use at a global level. This is complemented by a number of semi-structured interviews on the role of Germany conducted with representatives from the German ministries, including the Federal Ministry for Economic Cooperation and Development (BMZ), the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Foreign Office (Auswärtiges Amt, AA). Further interviews took place with a specialist from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and a former member of United Nations Secretary-General's Advisory Board on Water and Sanitation (UNSGAB) (see Table 1).

No.	Organisation	Unit
1	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)	Water management, soil conservation
2	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	Sustainable water policy
3	Foreign Office (Auswärtiges Amt, AA)	International climate and environmental policy
4	Ministry for Economic Cooperation and Development (BMZ)	Water, urban development, mobility
5	United Nations Secretary-General's Advisory Board on Water and Sanitation (UNSGAB)	-

Source: Authors

2 Challenges and importance of water resources in light of global sustainability

The hydrological cycle shows the close connections between local and global water issues: it not only connects freshwater resources¹ around the globe but also ensures the replenishment of rivers, lakes and groundwater aquifers locally. For assessing the challenges and relevance of water resources in light of global sustainability, we need to

1 In the following, the terms 'freshwater resources' and 'water resources' are used synonymously, as are the terms 'water cycle' and 'hydrological cycle'.

distinguish between the **local** or the basin perspective, for which property rights systems of individuals and nation states and issues of national sovereignty are important, and the **global** perspective, with its focus on global interests. Therefore, in the following we differentiate between the local and regional aspects of water governance and use (Section 2.1) and the global dimensions of water governance and use (Section 2.2), and ask in what respects freshwater resources constitute a global commons (Section 2.3).

2.1 Local and regional aspects of sustainable water use

The globally adopted Sustainable Development Goals (SDGs) address water specifically in target 6 (“Ensure availability and sustainable management of water and sanitation for all”), but water also plays a prominent role in achieving progress towards other SDGs, including energy security, health, education, biodiversity protection and many others (see Section 3.2.1).

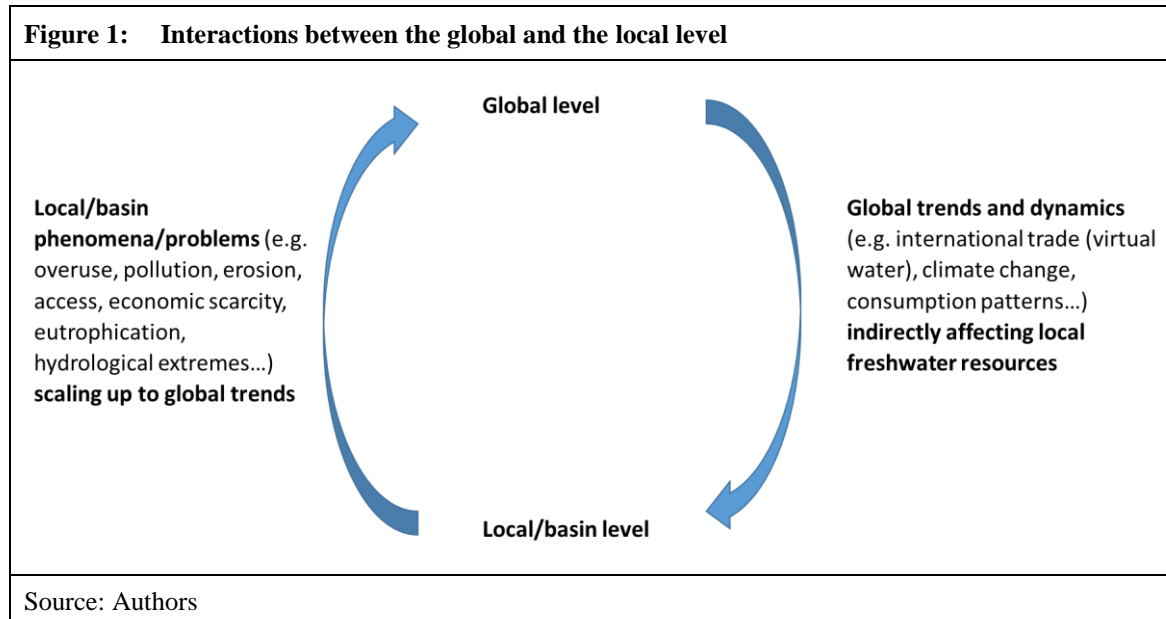
Achieving good water governance at the local and basin level is reflected in target 6.5 on Integrated Water Resources Management (IWRM). While the water cycle spans the globe, freshwater resources are generally confined to their respective basin or aquifer. Acknowledging this, IWRM, the internationally acknowledged paradigm for sustainable water management, calls for the management of water bodies at the watershed/catchment level of rivers, lakes or groundwater aquifers. However, despite IWRM many local and regional water issues continue to prevail.

One of the most pressing problems is the **lack of access** to drinking water and sanitation and thus **economic water scarcity**. Today, 844 million people still lack access to basic drinking water services (most of them in rural areas) and 2.3 billion people lack access to a safely managed sanitation service (United Nations, 2018a), with well-known implications for income, health, gender equality and education. Closely linked to the issue of access to sanitation is **water quality** and point and non-point pollution of water bodies. Globally, most wastewater from households and industry is released untreated (United Nations, 2018a), and chemicals used in agriculture negatively affect health and ecosystem functioning as well as availability of clean water, thereby increasing water scarcity. In many regions of the world, water resources are increasingly overused, often causing damage to ecosystems and reducing biodiversity. Increasing **physical water scarcity** (together with increasing demand due to population growth and economic development) increases competition and conflicts over water resources. The mobilisation of groundwater for use in agricultural and drinking water has led to tremendous progress in rural development, but has also caused a severe depletion of aquifers in some countries.

Even though the effects of pollution, overuse and water scarcity manifest themselves at the local to basin level, the drivers are confined neither to the local nor to the basin level. Local water governance fails to address this complexity, which can only be addressed through the interplay of multiple levels of water governance, including the global level.

2.2 Global challenges of sustainable water use

Despite the fact that many water problems are caused locally, it has become increasingly clear in recent years that some drivers are situated beyond the local and basin level – not least due to the increasing social interconnectedness of the world system (Conca, 2006) – and call for a global assessment and handling. The interaction here is twofold – from the global to the local (global trends and dynamics having implications on local freshwater resources) and from the local to the global (local phenomena scaling up to the global level) (see Figure 1).



The repercussions of global environmental change and particularly **climate change** on the global water cycle put water resources under pressure in many parts of the world. Climate change as a global phenomenon increases uncertainty regarding resource availability (rainfall patterns) and raises the question how best to adapt to an ever-changing environment. For example, two-thirds of the world's population experience severe water scarcity for at least one month per year (Mekonnen & Hoekstra, 2016). This situation is exacerbated by the impacts of climate change on the water cycle, increasing both severity and frequency of droughts and floods. By 2030, water scarcity might displace as many as 700 million people (HLPW, 2018). The impacts of climate change (but also climate mitigation strategies favouring renewable non-carbon energy policies such as biofuels) can lead to harsh competition over water in and between countries (European Union 2012:47-48). Even though climate change is beyond the influence of single national governments and therefore needs to be addressed at the global level, and even though impacts of climate change on freshwater are caused by global emissions, effects occur and operate on regional and local levels, not on the global level. Over-extraction of water and degradation of water occur in one place, and affect human material welfare and socio-economic conditions there; conversely, limiting the use of a river or aquifer ameliorates neither water-scarce conditions nor water pollution elsewhere.

Global socio-economic trends contribute to and reinforce water scarcity and water pollution at regional and local levels. World trade and global capital flows, population growth, rising consumer demands, changing consumption patterns, economic development,

ongoing urbanisation, the widespread cultivation of marginal land and construction of large-scale infrastructure (e.g. dams, river diversion, irrigation systems) are globally ubiquitous phenomena with effects on the resource availability and on aquatic and non-aquatic ecosystems. The increasing international export of goods and, implicitly, the amount of the water used for their production (virtual water trade) puts pressure on local water resources, especially when water prices do not adequately reflect external effects, while virtual water imports may also alleviate local physical water scarcity. Hoekstra (2011) assumes that one-sixth of global water problems are caused by the production of export goods.

The driving forces behind these global trends and phenomena are outside the realm of water governance (but part of agriculture and energy policies) and often even outside the realm of single national governments (e.g. international trade). Nevertheless, they can potentially eradicate progress and achievements of local water governance and management, such as improved water use efficiency or protection of water bodies (Hoekstra, 2011; Pahl-Wostl et al., 2008). Since the dynamics and interests behind drivers such as international trade or climate change are powerful and transnational, addressing them at the level of a single country will hardly succeed (Conca, 2006). Furthermore, addressing these trends at the basin or national level (e.g. through taxes on water pollution or a water-scarcity rent) could lead to disadvantages for the implementing nations (Hoekstra, 2011).

Besides these global to local effects, the problem characteristics underlying overuse and pollution, and the challenges of increasing hydrological extremes, and their implications for sustainable development are similar in many places and can be considered as (nearly) universal. Furthermore, the aggregation of local or regional water problems may reach global dimensions: if water bodies as life-supporting ecosystems deteriorate at large scales across the globe these local phenomena add up to a global (universal) threat to sustainable development. Hence, local phenomena may scale up to the global level. This also raises the question whether freshwater resources can be understood as a global commons.

2.3 Freshwater resources as a global commons?

The theory of collective goods distinguishes four different categories of goods according to the criteria rivalry of consumption and excludability of benefits. Non-rivalry of consumption means “... each individual’s consumption of such a good leads to no subtraction from any other individual’s consumption of that good” (Samuelson, 1954, p. 387). Excludability of benefits asks whether the provider of a good is able to exclude potential consumers from the utilisation of the good at justifiable costs based on private law (Ostrom & Ostrom, 1977). On this basis four types of goods can be distinguished (see Table 2).

		Rivalry in consumption	
		yes	no
Excludability based on private law	yes	Private goods	Toll/Club goods
	no	Common pool resources	Public goods

Source: Own presentation based on Ostrom and Ostrom (1977, 1999, p. 78)

Public goods are characterised by non-rivalry of consumption and non-excludability of benefits (e.g. lighthouses); toll or club goods by non-rivalry of consumption and excludability of benefits (e.g. tennis clubs or toll bridges); common pool resources by rivalry of consumption and non-excludability of benefits (e.g. fisheries or groundwater resources); and private goods by rivalry of consumption and excludability of benefits (e.g. private cars). Hence, common pool resources are open to the use of all members of a given community, but the use of the resource of one person reduces availability of the resource for others.

Depending on the context of use, freshwater may display characteristics of a common pool resource (e.g. groundwater resources), but also of a public good (e.g. a navigational river), a club good (e.g. community organised water distribution systems) or a private good (e.g. bottled water), (Dombrowsky, 2004). The concept of water resources as a common pool resource – or common good – has a long history in water management. Until recently, it was mainly applied to locally confined water bodies such as rivers, lakes and groundwater. In particular, the work of Elinor Ostrom centred on the problems of collective action for the governance of commonly used local resources and their protection from pollution and overuse, among them water (Ostrom, 1990).

According to our understanding, the term “common good” is often used synonymously for common pool resources; however, it could in some instances also refer to a public or a club good. In particular, with respect to global collective goods, the term “common good” seems to be more common than “global common pool resources”. Typical examples for global common goods that are shared by all people and need to be protected from overuse, degradation and pollution are the high seas, the atmosphere, Antarctica, and outer space (IUCN, UNEP, & WWF, 1980).

More recently, scholars have argued that humankind has entered the Anthropocene, in which human activities are shaping geo-biophysical interactions on Earth, which poses a fundamental threat to a resilient Earth system (Rockström et al., 2009). In view of this debate, some authors have broadened the definition of global commons, subsuming freshwater resources. They define global commons as “the cultural and natural goods and resources that are accessible to all, including natural materials such as air, water, ecosystems and planetary processes” (Bollier, 2002, quoted in Nakicenovic et al., 2016, p. 37).

For (global) freshwater resources, it is argued that they play a critical role for Earth and societal resilience since they support, sustain and stabilise the Earth system and ecosystems around the globe (Nakicenovic et al., 2016). This critical role makes freshwater resources eligible for inclusion under the concept of “concern for humankind” and therefore confers on them the status of a global common good. It is argued that the protection of freshwater resources is similar to the protection of biodiversity and of wetlands of international importance, both of which are also locally, territorially confined, but regulated by global environmental regimes such as under the Convention on Biological Diversity (CBD) and the Ramsar Convention respectively. This is also comparable to the UN Convention to Combat Desertification (UNCCD), which addresses the wide-spread, but locally confined issue of land degradation.

Still, as mentioned above, water resources are confined to the local or basin level, and the question is whether their overuse or pollution can be aggregated globally in a similar manner to that of the loss of biodiversity or the effects of greenhouse gas emissions.

Water pollution and water abstraction in international river basins certainly have an international dimension and require international cooperation (since externalities spill over borders). However, water pollution and abstractions have no general global relevance in the sense of a clear global physical cause-and-effect-chain comparable to, for instance, climate change (see Table 3). Therefore, the notion of water as a global commons differs from other environmental problem structures in which contaminants spread and provoke implications at a global level, such as is the case, for instance, for greenhouse gases or for stratospheric ozone depletion. For these problems, global environmental regimes, such as the United Framework Convention on Climate Change (UNFCCC) and the Montreal Protocol, have been set up respectively. At the same time, water degradation is also not fully comparable to the loss of biodiversity which regulated through the United Nations Convention on Biological Diversity (CBD), as water does not face the problem of the extinction of specific species at the global level.

Water governance does not easily fit into this particular logic of global environmental regimes due to its specific characteristics:

- the interdependencies between the various water-using sectors in terms of water quantity and quality;
- the public-good character of (water-related) environmental services (e.g. protection of ecosystems, protection from floods);
- the common-pool resource characteristics of open-access water bodies;
- the investment needs for water infrastructures that exhibit economies of scale, leading to problems in allocation and pricing if those infrastructures have multiple purposes;
- the manifold effects of large-scale infrastructures (e.g. dams, reservoirs) complicating the balance of costs and benefits and the distribution of benefits between social groups; and
- the uncertainties regarding resource behaviour (e.g. groundwater bodies, purification capacity, interaction between land and water use) and the cause-and-effect-chain that make water governance and management more difficult.

Most importantly, conceptually there is no “global water resource”, which would need protection or being governed as a single entity; overuse at one place does not reduce the availability at another place (as is, for instance, the case with the atmosphere and its protection from carbon emissions in order to prevent climate change). Hence, we would not refer to water as a *global* common pool resource, given that non-excludability and rivalry in consumption do not apply at the global level. However, when referring to freshwater as a global commons, it is not “the global water resource” that is in focus, but rather the functions performed globally by water resources in sustaining ecosystems and nurturing the resilience of the Earth system. In that sense, the protection of freshwater resources is indeed similar to the protection of biodiversity or the fight against land degradation including desertification: the more river basins degrade globally, the more the stability of the Earth system is put under stress. This is so even though we do not expect tipping points comparable to the melting of the Arctic ice sheet and we do not face the problem of loss of specific species at global level.

However, given the global earth system stability functions of water, there is arguably a need to develop and coordinate measures at the global level for safeguarding the resilience functions performed by freshwater resources. In the following sections, we will argue that

this requires clearly distinguishing between water governance (and management) problems caused at the local and regional or basin level and those caused by external drivers. Given that many of these problems happen at many places on Earth simultaneously, these (nearly) universal local as well as transboundary water problems arguably require improved *glocalised* management and governance approaches (Gupta, 2014) – in other words, improved local and regional approaches adapted to local circumstances, but which pay more attention than previously to global drivers. In addition, improved global governance approaches are needed that take into account repercussions at the global level (e.g. for Earth system stability) and interactions of water with other global processes.

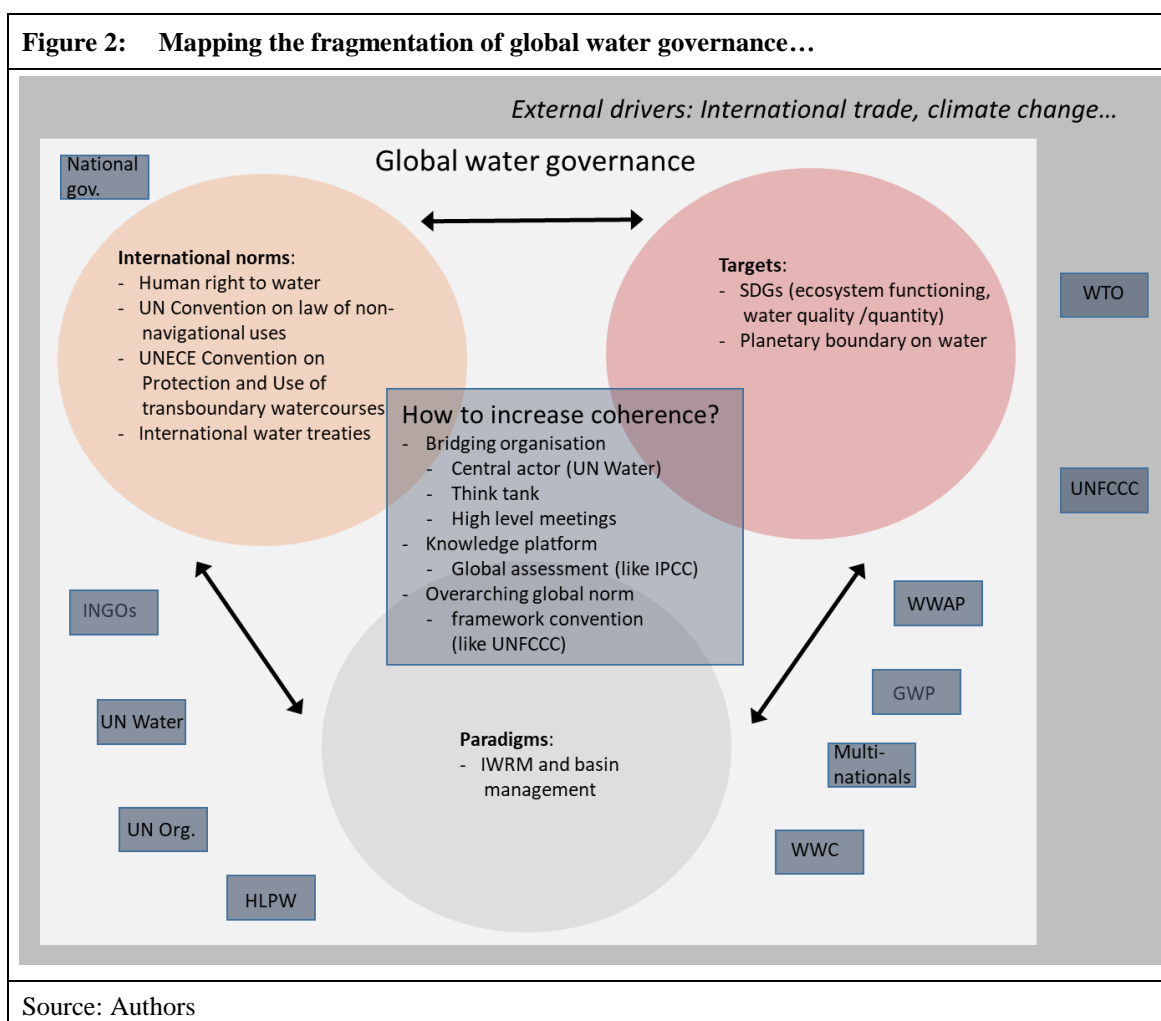
Global environmental problem	Spatial disparity	Conventions / Regimes
Climate change	Cause-and-effect pattern distributed globally; major impact on global hydrological cycle	UN Framework Convention on Climate Change
Stratospheric ozone depletion	Cause-and-effect pattern distributed globally	Montreal Protocol on Substances that Deplete the Ozone Layer
Air pollution	Cause-and-effect pattern distributed regionally	UNECE Convention on Long-Range Transboundary Air Pollution
Biodiversity loss and deforestation	Causes and effects linked across all spatial levels, uneven global distribution	Convention on Biological Diversity; Ramsar Convention on Wetlands of International Importance
Land degradation/ desertification	Causes and effects linked across all spatial levels, uneven global distribution	UN Convention to Combat Desertification (UNCCD), focus on arid, semi-arid and dry sub-humid areas
Transboundary water bodies	Cause-and-effect patterns essentially distributed regionally	UN Watercourse Convention UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes; EU Water Framework Directive; SADC Protocol on Shared Watercourses; bilateral/multilateral treaties
Global functions of local water resources for ecosystems and nurturing the resilience of the Earth system	Cause-and-effect patterns essentially distributed locally and regionally. Still, the more basins degrade, the more are global functions of local water resources threatened.	None

Source: WBGU (2001), modified by the authors

3 Global water governance: Taking stock of a fragmented architecture

As of now, the global water governance architecture lacks a major institution that sets rules or provides mechanisms for conflict resolution. Instead, it is marked by a plurality of only

loosely connected governance institutions and organisations that address one or several of the characteristics of water resources (Baumgartner & Pahl-Wostl, 2013). In the following, this fragmented global water governance architecture is outlined by referring to the main **international norms** (consisting of regimes on transboundary waters and paradigm- and norm-based global water institutions), internationally debated and agreed **target systems** of sustainable water governance, **paradigms** and policies for achieving these targets and the central **actors** in this field (see Figure 2). However, given the abundance of institutions, water forums and related organisations, this study has to be selective. We therefore focus on cases that represent typical elements of the global water governance architecture: the main UN conventions on transboundary water resources, a global legal instrument (human right to water), a global management paradigm (Integrated Water Resources Management) and central actors coordinating water activities at the global level. Section 3.1 introduce international norms, Section 3.2 target systems, Section 3.3 paradigms, Section 3.4 actors and Section 3.5 identified gaps and demand for regulation.



3.1 International norms

For a long time, regime-building for sustainable water governance focused on transboundary water problems and cooperative governance of water bodies, but not beyond (Conca, 2006, p. 28). In the meantime, there are at least two types of international norms of

water governance: (i) global regimes for transboundary waters and related transboundary agreements (Section 3.1.1), and (ii) norm-based approaches to global water governance (Section 3.1.2).

3.1.1 Regimes on transboundary waters

Global regimes on transboundary waters include the UN Convention on the Law of Non-navigational Uses of International Watercourses (1997) and the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992). Besides these processes at the global level, there are regional mechanisms referring to transboundary waters (such as the SADC Protocol on Shared Watercourses or the European Water Framework Directive). In addition, there more than 500 agreements at bi- or multilateral level on the use of specific transboundary water bodies (Dombrowsky, 2007).

Water bodies are transboundary, if they mark or cross the boundaries between two or more states. Contrary to what one might expect (and similar to the absence of an overarching regime on water resources), for a long time there has been no global regime on transboundary waters. The first step towards an international regime governing transboundary waters for purposes other than navigation was made in 1966 with the **Helsinki Rules** of the International Law Association (ILA), a non-governmental organisation. They became the most relevant “soft law” principles in international water law, which provided the basis for the negotiation of the **UN Convention on the Law of the Non-navigational Uses of International Watercourses** (UN Watercourse Convention), many river treaties and regional water conventions. The **UN Watercourse Convention** was negotiated by the Sixth Legal Committee of the UN General Assembly and adopted by the UN General Assembly on 21 May 1997 and finally ratified in 2014. It regulates the protection, use and management of international watercourses (including those groundwater bodies that are connected to surface water). At the core of the UN Watercourse Convention are three substantive obligations: (i) the obligation to utilise an international watercourse in an equitable and reasonable manner, (ii) the duty to prevent significant harm to other riparian states and (iii) the obligation to protect international watercourses and their ecosystems against unreasonable degradation (McCaffrey, 2003). In addition, the convention contains the obligation to provide prior notification of planned measures that might affect other watercourse states and the general obligation to cooperate with other watercourse states. McCaffrey (2003) argues that the principles of equitable and reasonable utilisation, avoidance of significant harm and prior notification reflect the codification of existing norms. In contrast, the obligations to protect international watercourses and to cooperate can be understood as emerging principles.

The **UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Helsinki Convention)** negotiated by the UN Economic Commission for Europe and ratified in 1992 differs in some respect: next to transboundary rivers it also applies to all types of transboundary aquifers and considers land–water interactions, follows an ecosystem approach, and defines “prevention obligations” and “requirements for authorisation”, thereby operationalising the obligation to prevent harm to downstream riparian states. The parties to the Helsinki Convention extended it by protocols (e.g. the Protocol on Water and Health, which defines principles and measures to combat water-related diseases, and to provide safe drinking water) and have set up standing bodies.

The Convention foresees a reporting system, and compliance and control procedures. Access to information and procedures for public participation are pronounced in the Helsinki Convention.² In 2003, the parties to the Helsinki Convention amended it to allow accession by UN member States outside the UNECE region; the amendment entered into force on 6 February 2013.

The **Berlin Rules** drafted by the ILA in 2004 are the very first attempt to form at least one comprehensive international legal instrument, applying to surface and groundwater, both national and transboundary, to navigational and non-navigational uses, and to consider development needs and the protection of the resource. They endorse universally accepted principles such as the sustainable management of water, the prevention or minimisation of environmental harm, and the integrated management of water and other resources. They ask for the protection of the ecological integrity of water, as a necessary step to sustain water-dependent ecosystems, to ensure adequate flows, to prevent, eliminate, reduce or control pollution; for the establishment of water-quality standards, and the application of a precautionary approach and environmental impact assessments (J. Dellapenna & Gupta, 2008; ILA, 2004). However, as with the Helsinki Rules, the Berlin Rules have no formal standing yet and are not legally binding, although "...those rules and resolutions possess a considerable authority by virtue of the fact that they reflect the established customary principles of international water law" (S. M. Salman, 2007).

The **European Water Framework Directive** (European Parliament and Council, 2000) and the associated **Groundwater Directive** (European Parliament and Council, 2006) cover all waters, national and transboundary ones within the European Union. The directives aim at achieving a good ecological status of surface water bodies and a good quantitative and chemical status of groundwater bodies, and features specific compliance and enforcement mechanisms (Rieu-Clarke, 2008, pp. 9-19). However, the EU WFD is a specific and exceptional case of a supra-national law within a politically integrated region (Allan, Tignino, & Loures, 2011).

In addition to these major conventions, more than 500 multi- and bilateral agreements on international waters (Dombrowsky, 2007) and more than 80 international river basin organisations exist (Schmeier, Gerlak, & Blumstein, 2016). These agreements vary strongly according to the subject, but the great majority are narrow in scope in the sense that cooperation focuses on the solution of a specific problem in the river basin (e.g. joint hydropower project, water allocation, flood protection). Most commonly, the respective international river basin organisations hold merely advisory or coordinating functions, but authoritative management and regulatory functions are rarely delegated to them (Dombrowsky, 2007; Schmeier, 2013). Still, the respective agreements and organisations arguably play an important role in sustainably governing the resource and achieving the SDGs, for example, in implementing IWRM at all levels, among other things through transboundary cooperation (target 6.5). Cooperation on transboundary aquifers is in a rather early stage. The focus so far has been mostly on gathering hydrological data and developing models of aquifer behaviour, with the exception of the Franco-Swiss Genovese aquifer

2 The Helsinki Convention refers to the UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) and to the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention).

(Cobos, 2002). Due to the geopolitics and power asymmetries between basin states, among other reasons, there is limited evidence that the UN Watercourse Convention is influencing negotiations (or re-negotiations) in international basins. It has therefore been doubted that the Convention significantly contributes to the development of effective transboundary water governance structures (Allan, 2001; Conca, 2006, p. 102-120).

When looking at the dynamics and development of these different institutions over the last decades, important steps towards the convergence of universal norms and guiding principles can be observed. However, at global level two separate regimes have evolved, the UN Watercourse and the UNECE Helsinki Conventions, which are not identical, but which can in many respects be seen as complementary. Still, in that sense it is difficult to speak of one unified global regime for transboundary water. The 1997 UN Watercourse Convention can certainly be valued as a step forward given that it codifies the principles of equitable and reasonable utilisation, avoidance of significant harm and prior notification (Conca, 2006; S. M. A. Salman, 2007). However, so far only 36 countries have ratified the convention. Furthermore, the UN Watercourse Convention has been criticised that it does not sufficiently take other global issues such as climate change, the loss of biodiversity or virtual water trade into account. Furthermore, it lacks an institutional body similar to the UNFCCC or CBD which would be able to react to new to new scientific knowledge or developments and that would monitor implementation (Gupta, 2016).

With a view to the opening of the UNECE Convention to non-UNECE member states, and the recent accession of a number of countries, this convention has formally developed from a regional regime to one with global scope. This is welcomed, since the UNECE Helsinki Convention is more demanding regarding water-resources protection and has set up standing bodies.

Overall, the mode of cooperation in the transboundary domain is strongly characterised by negotiations between nation states and the respective governmental agencies. But there are noteworthy exceptions and a clear tendency towards diversification. State and non-state actors, public and private organisations now cooperate at all levels: for instance, UNESCO's International Hydrological Programme and the Stockholm International Water Institute are involved in training and research; the Global Water Partnership (GWP) and International Network of Basin Organizations provide technical support; multilateral development banks and bilateral donors fund infrastructure and institutional development. In addition, in the recent past, non-state actors, such as private banks started playing an increasing role in transboundary water management (e.g. Dombrowsky & Hensengerth, 2018; Hensengerth, 2015).

3.1.2 Norm-based global water institutions

One of the chief phenomena of global water governance is that a central global regime has not emerged. At the global level, there is nothing comparable to the EU Water Framework Directive that could serve as a model (Rieu-Clarke, 2008). Thus, global governance of water comes about as a flow of norms and specialised institutions, one of them being the human right to water.

Although the genesis of the human rights approach to drinking water dates back to the 1970s, it gained momentum in the advent of the Dublin International Conference on Water

and the Environment in 1992 (Kirschner, 2011). The United Nations Committee on Economic, Social and Cultural Rights furthermore set a decisive landmark by General Comment No.15 in 2002: “The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses.” It concluded that state parties “have immediate obligations” and set out “to take deliberate, concrete and targeted steps towards the full realisation of the right to water” (UN CNSCR 2002, p. 2). From then onwards, the human right to water gained international visibility and acceptance. In May 2010, the UN General Assembly finally declared access to clean water and to sanitation a human right (United Nations, 2010b). Following the UN General Assembly resolution, the UN Human Rights Council adopted another resolution stating that the rights to water and sanitation are part of existing international law and confirmed that these rights are legally binding upon States (United Nations, 2010a).

Germany and Spain played an important role in convincing the UN Human Rights Council to appoint a “special rapporteur on the human rights to safe drinking water and sanitation” (Caterina de Albuquerque, now Leo Heller). Within the UN system, especially this special rapporteur’s commitment but also its backing by international organisations (e.g. the World Health Organization, UNICEF, and UNEP) and an international network of civil society and non-governmental organisations (i.e. the Friends of the Right to Water) significantly contributed to the approval of the right (Interview 5). These actors did not recognise water as an economic good, arguing that this equals privatisation and would deprive the most marginalised and poorest people from reliable and affordable water services.

At national levels, only a few countries, such as South Africa, explicitly incorporated a human right to water in their constitution and respective implementing legislations. The human right to water is strongly promoted since its adoption. It was related to the fulfilment of the Millennium Development Goals (MDGs) and now the SDGs, particularly SDG 6 with its aim to provide universal access to safe drinking water and sanitation by 2030.

3.2 International targets

The Sustainable Development Goals (SDGs) can be considered as the internationally acknowledged target system for sustainable development that guides policies, strategies and activities at national level. In line with this, SDG 6 and the many interlinkages between SDG 6 and other SDGs represent a politically agreed target system for global sustainable development (Section 3.2.1). The concept of planetary boundaries, which originates from the scientific debate around the carrying capacity of our planet, is also listed here, since it dominates current debates around the sustainable use of resources at the global level and the global commons (Section 3.2.2).

3.2.1 The Sustainable Development Goals

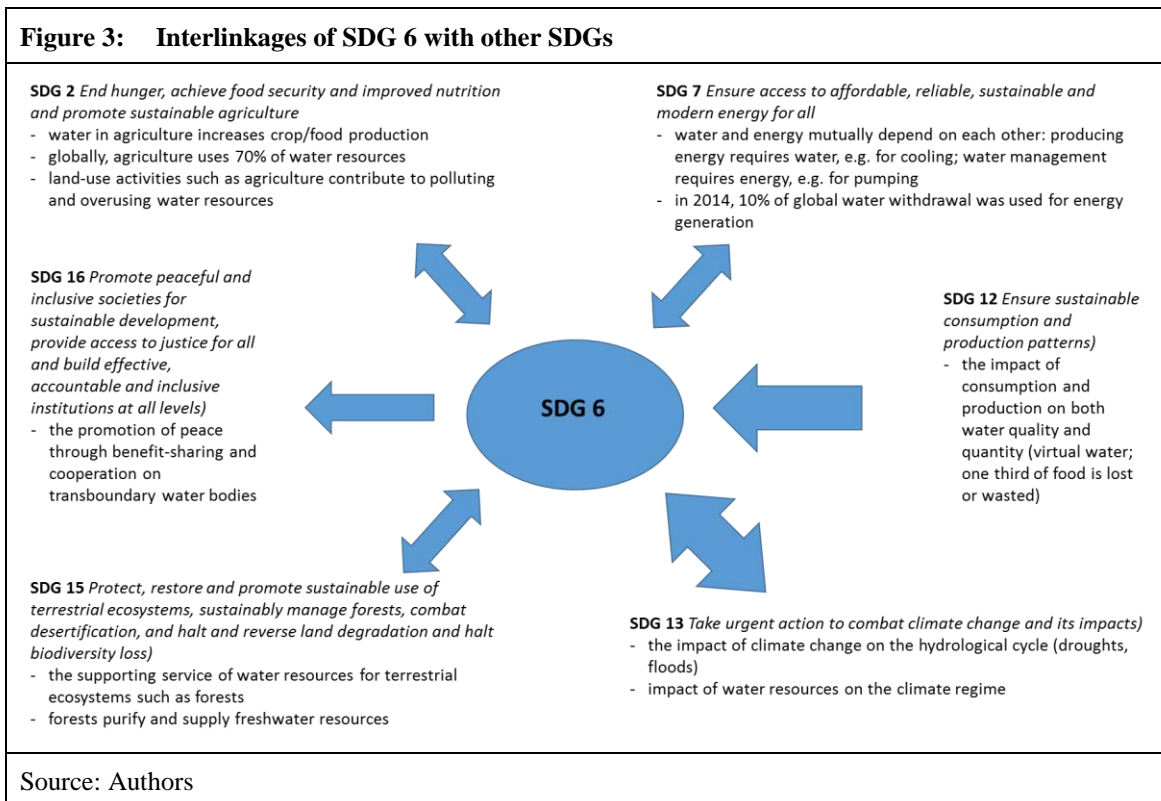
With the adoption of the 2030 Agenda and its Sustainable Development Goals (SDGs) in 2015, a global target system for sustainable development has been established. The underlying recognition that social and economic development are based on a functioning and supportive Earth system marks a paradigm shift in global governance and sustainable development. The identification of water as a separate SDG (SDG 6) is associated with a

re-evaluation of the topic at the international level and enhanced the status and importance of water resources for human development.

With regard to sustainable water use, both SDG 6, which directly focuses on water, and a number of other SDGs, which are indirectly linked to sustainable water use, are important. Goal 6 demands to “ensure availability and sustainable management of water and sanitation for all”. It aims at providing universal and equitable access to drinking water and sanitation, improving water quality, increasing water-use efficiency, implementing IWRM, protecting and restoring water-related ecosystems, expanding international cooperation for water, and strengthening participation in water provision. This list of targets mainly pertains to water governance and management on the local level. Target 6.5 on the implementation of IWRM and transboundary water governance, and target 6.6 on the protection and restoration of water-related ecosystems come closest to supporting the notion of water as a global commons.

Topics related to water use at the global level and protection of freshwater as a global commons can mainly be derived from the many water-related interlinkages of the SDGs. These include the protection of water-related ecosystems (SDG 15), the impact of patterns of consumption (SDG 12), the impacts of climate change on water resources (SDG 13), the use of water to generate energy and cultivate biofuels (SDG 7), and the use of water for increasing agricultural production (SDG 2). The most important interlinkages with regard to water as a global commons are portrayed in Figure 3 (United Nations, 2018a).

Besides the interlinkages between SDG 6 and other SDGs, manifold interlinkages exist between the different targets of SDG 6. Wastewater can serve as one example: in developing countries, 90 percent of municipal wastewater is discharged without treatment. The resulting pollution of water bodies and the environment in general puts pressure on water quality, biodiversity and ecosystems in general (HLPW, 2018).



These interlinkages may be mutually enforcing (synergies, e.g. improving access to drinking water (SDG 6) on the one hand and gender equality (SDG 5) and education for all (SDG 4) on the other). However, often they appear as trade-offs, which need to be mitigated when implementing the SDGs (e.g. using more water for producing food (SDG 2) vs. water for a stable environment (SDG 15) or sustainable energy production (SDG 7) (Janetschek & Dombrowsky, 2017). When addressing these interlinkages and trade-offs, the relevance of freshwater as a global commons, which supports many dimensions of human development, but may also threaten them, comes to the fore. Addressing the interlinkages requires that sector policies and strategies are coordinated,³ that the limits of the resource are taken into account when allocating (or re-allocating) water-use rights for sectoral use, including an agreed amount for maintaining the resource base; that externalities are regulated by setting the desired ambient quality for the respective water bodies and by defining the relevant instruments to achieve the desired quality standards and limits to use.

3.2.2 A planetary boundary as a limit to global water use

The concept of planetary boundaries defines an “overall environmental target corridor for earth system governance” (Biermann, 2012) by setting limits for sustainable resource use for nine resources, one of them being freshwater resources. In order to avoid non-linear environmental change for freshwater resources, Rockström et al. propose a quantitative threshold for global use (<4,000 km³/year, while the current consumptive use is about 2,600 km³/year), arguing that “transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental- to planetary-scale systems” (Rockström et al., 2009). In the case of water, they argue that the manipulations of the freshwater cycle at a global scale (via diverting and abstracting river flows and manipulating vapour flows) justifies determining a global threshold, despite the local or basin confinement of the resource.

Unlike other environmental problems calling for global governance solutions, such as climate change, the concept of a global maximum use rate for water is highly contested for different reasons. First, it is debateable whether the bio-physical processes of the global water system are similar to those causing climate change, which may go along with “global tipping point[s] beyond which global processes will begin to function in fundamentally different ways than they do at present or have done historically” (Rockström et al., 2009). Blomqvist, Nordhaus and Shellenberger, for example, posit that freshwater resources are non-threshold systems at the global level, and that a global limit may not be appropriate (Blomqvist, Nordhaus, & Shellenberger, 2012, p. 32). Second, the currently proposed threshold for water is disputed. Molden has made the point that the freshwater boundary might be too generous: supplies may already be exhausted in some regions, while financial and institutional constraints exist to expand water use in other regions where water availability is not the bottleneck (Molden, 2009), thus veiling locally relevant overuse of water resources (Jaramillio & Destouni, 2015). Furthermore, water bodies (rivers, lakes and groundwater sources) may be polluted to an extent that they are no longer usable (<https://www.nrdc.org/stories/water-pollution-everything-you-need-know>; <https://www.water-pollution.org.uk/>).

3 see DIE’s research on the WEF Nexus, <https://www.die-gdi.de/nexus/>

3.3 Paradigms: River basin management and Integrated Water Resources Management (IWRM)

River Basin Management (RBM) was the dominant paradigm for water policies between the 1930s until the late 1960s. The hydro-centric and single-sector approach aimed at maximising the exploitation of a river basin's water resources for economic development (Hooper, 2003). In the 1970s and in the context of rising environmental awareness, researchers and policymakers broadened their view to adopt an eco-system approach to water resources, which later on culminated in the view of river basins being integrated ecological systems with multiple functions. The paradigm of Integrated Water Resources Management (IWRM) emerged and prevails until today.

The IWRM paradigm illustrates the interdependencies between local and global levels: it has become the key global paradigm of water policies, but also shapes local and regional approaches to water management. Conversely, from the perspective of water as a global common good, failure to achieve good water quality through appropriate RBM also affects transboundary interests and the overall status of water resources.

IWRM is defined as “(...) a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP, 2000). It builds upon (i) the recognition of all water users and water-using sectors including ecosystems; (ii) cross-sectoral water management based on integrated planning; and (iii) the spatial integration and the associated multi-level coordination of institutions concerned with local, national, and regional water resources management (Conca, 2006, pp. 123-165).

The concept emerged as the reference point of the global water discourse in the 1970s (Schmidt, 2012), but gained stronger political attention following the Dublin and Rio conferences in 1992 (Agenda 21). The Johannesburg Plan of Implementation (JPOI) at the World Summit on Sustainable Development in September 2002 (Rio+10) then called for the development of IWRM and water efficiency plans by 2005. This has promoted activities on the national level: developing countries have, with international assistance, gone through multi-year IWRM planning processes resulting in new national water policy approaches and new water laws (e.g. Horlemann & Dombrowsky, 2012). The IWRM concept evolved on the occasion of various other international meetings with several UN organisations – along with the Global Water Partnership and the World Water Council⁴ as key promoters outside the UN system (Conca, 2006; Rahaman & Varis, 2005). The Commission on Sustainable Development (CSD) decided to assess the progress made towards IWRM in 2008 and in 2012. Even if these CSD decisions are not legally binding, the established monitoring process was an important step towards institutionalising IWRM as an international norm. In 2015, IWRM became a target of SDG 6. Assessments of UN Water in 2011 (UNEP, 2012) and more recently in 2018 as part of the monitoring of SDG 6.5 indicator 6.5.1 measure the implementation of IWRM. As this latest report shows, 80 percent of the 172 reporting

4 The Global Water Partnership (GWP) is an international network (comprising of government and non-government organizations, UN agencies and the private sector) advocating the implementation of Integrated Water Resources Management (IWRM). Membership of the World Water Council (WWC), an international multi-stakeholder platform, is similarly diverse, however, with the private sector dominating in numbers and influence.

countries have “laid the foundations for IWRM”, but only 20 percent are achieving their related policy objectives, with 60 percent of countries “still unlikely to meet the global target unless progress significantly accelerates” (UN-Environment, 2018).

IWRM often builds on river basin management (RBM) as the appropriate level for water policies. In response to the lack of coordination of water use and actions to address pollution among different sectoral users or across administrative or spatial boundaries, river basin organisations (RBO) were created to comprehensively assess and manage water at the basin level. Their design ranges from autonomous river basin authorities to agencies, coordinating councils or commissions and partnerships (Huitema & Meijerink, 2014). Such RBOs have the task to assess the status of water resources and use in the basin and, on this basis, develop river-basin management and water-allocation plans.

The huge variance in institutional design, competences, and of human, financial and technical capacities etc. of river basin organisations all over the world makes it difficult to formulate general conclusions about their functioning (Dombrowsky, Hagemann, & Houdret, 2014). However, based on their comparative analysis, Meijerink and Huitema (2017) conclude that RBOs usually constitute an additional layer on top of existing multi-purpose jurisdiction, and that the effectiveness of RBOs hinges much on their ability to manage ‘institutional interplay’ with and their connectivity to the existing institutional environment.

Beyond the specific difficulties in implementing RBM, IWRM as such also still encounters various challenges. First, it is often perceived as an elitist concept, for instance by governments in developing countries who cannot easily mobilise the resources needed for implementation. At the same time, it is criticised that donors tend to implement blueprints, while oftentimes undermining functioning water management systems (Giordano & Shah, 2014). Second, water-governance decisions to implement a consistent IWRM approach often have far-reaching political implications and trade-offs, affecting diverging interests of sectors, regions or interest groups, but it is questioned that IWRM may be able deal with these politics (Allan, 2003; Jensen, 2013).

Finally, progress in implementation of both IWRM and RBM is difficult because, as Mollinga expresses it: “IWRM is a moving target since new problems emerge and evolve over time, which requires considerable flexibility and regular attention to these changes” (Molle, 2008, p. 131). So far, monitoring in the context of SDG 6.5 relies on subjective assessments of national governments based on different understandings of what IWRM should imply. Moreover, a monitoring indicator for the implementation of transboundary water management in the SDG process (SDG indicator 6.5.2) is still disputed. However, even if monitoring is incomplete and subjective, it may still enable a better and more detailed knowledge of local water use, and how effectively the resource is managed.

3.4 Central actors: Roles and responsibilities

The current global water governance architecture comprises various actors, including UN organisations, national governments, private companies, international conferences and multi-stakeholder knowledge platforms (e.g. the Stockholm World Water Week, the World Water Forum) and private-sector organisations (e.g. the World Water Council). This is

complemented by the work of various non-governmental organisations (e.g. the International Rivers Network (IRN), the International Union for the Conservation of Nature (IUCN)), networks such as the Global Water Partnership (GWP) and think tanks and research institutes (e.g. the Stockholm International Water Institute (SIWI) and the International Water Management Institute (IWMI)). These actors are all involved in the agenda setting and the implementation of SDG 6. To date, these actors are not adequately coordinated and sometimes even compete with each other for influence and resources (Newton, 2014). An attempt to address this coordination deficit within the UN system was the establishment of UN-Water (Section 3.4.1). In order to increase political leadership for water issues at global level, several high level political bodies have been established over time (Section 3.4.2). Next to these, agenda setting takes place in a number of international platforms and conferences (Section 3.4.3) and through private sector initiatives (Section 3.4.4).

3.4.1 UN-Water

UN-Water was founded in 2003 as an interagency mechanism for providing coherence and coordination of UN activities related to water, particularly with a focus on the implementation of the water-related issues of the Millennium Development Goals (UN Water, 2012). Today, UN-Water is expected to coordinate 32 UN agencies. Its mandate includes strategic policy development and monitoring (particularly of SDG 6) as well as communication and cooperation on water issues within the UN system and beyond (UN Water, 2012).

However, according to observers, UN-Water has, to date, not lived up to this central role as a coordinating body due to a number of reasons. Among them are its limited mandate and decision-making power as well as insufficient financial means (Baumgartner & Pahl-Wostl, 2013; Swann & André, 2018). In its current setup as an interagency mechanism UN-Water would need the support of an intergovernmental body in order to be able to coordinate the activities of member states and UN bodies to implement SDG 6 and beyond. In the absence of an intergovernmental body, it thus lacks the formal decision-making power vis-a-vis its UN member organisations, which are generally equipped with such bodies. Furthermore, it is not mandated to coordinate the activities of its partners such as GWP, SIWI or WWC (Newton, 2014). UN-Water is therefore not in the position to enforce a coherent and integrated approach to sustainable water governance and the implementation of the SDGs against the diverging interests of its UN member organisations. Since these member organisations have diverse (not primarily water-related) mandates (such as UNICEF focusing on children, the UN Human Rights Council on the human right to water and the World Health Organization on water quality, they each address specific aspects and tend to support different and sometimes contradictory policies (Swann & André, 2018). Accordingly, UN-Water has not yet significantly influenced global water governance processes nor contributed to reforms of the global water governance architecture (Baumgartner & Pahl-Wostl, 2013).

UN-Water's limited role can be illustrated by taking as an example the recent review process of SDG 6 in the High-Level Political Forum on Sustainable Development (HLPF). UN-Water stretched its mandate by producing a comprehensive synthesis report reviewing the progress on SDG 6 to inform the HLPF. The report stated that the world is not on track to

achieve SDG 6, and provided a number of recommendations on the way forward, including suggestions for improving global water governance (United Nations, 2018a). However, some governments rejected this endeavour on the basis of UN-Water's lack of mandate (interview, 29 Oct. 2018). Still, the recent practice supported by UNSGAB to appoint an executive head of a UN agency has chair of UN-Water has improved the standing, influence and convening power of the organisation (Swann & André, 2018).

3.4.2 High-level political bodies

In order to increase political leadership for water issues at global level, several high level political bodies have been established at UN level over time. In addition, in 2015 15 countries established Global High-Level Panel on Water and Peace.

In early 2004, the then United Nations Secretary-General Kofi Annan called on former Prime Minister Ryutaro Hashimoto of Japan to bring together eminent people to advise on how to solve the planet's foremost water and sanitation troubles. The purpose of the **United Nations Secretary General's Advisory Board on Water and Sanitation (UNSGAB)** was to suggest attainable recommendations and a concise plan of action, and then provide the high-level leadership needed to galvanize the international community into action on the Millennium Development Goal (MDG) targets for drinking water and sanitation. The German Government, namely BMZ and the Foreign Office, supported the establishment of UNSGAB. The former Parliamentary State Secretary of the BMZ, Ursula 'Uschi' Eid, initially as board member and later as chair of UNSGAB significantly improved the visibility of water issues, both internationally and within Germany. In particular, UNSGAB has helped to put access to drinking water and sanitation onto the international agenda. In its final report, UNSGAB calls for the following improvements of global water governance: establish a UN Intergovernmental Committee on Water and Sanitation, form a UN Scientific and Practice Panel on Water and Sanitation, strengthen UN-Water, set up a comprehensive and independently reviewed global monitoring framework, and make sure there is an independent voice for water (United Nations, 2015).

The **High-Level Political Forum on Sustainable Development (HLPF)** was established in 2013 as the review mechanism for evaluating the progress of SDG implementation (replacing the Commission for Sustainable Development) and for providing political leadership, guidance and recommendations for sustainable development (UN General Assembly, 2013). In its yearly sessions, it covers a range of six to seven SDGs under a certain topic and asks governments to report on their progress regarding implementation.

The HLPF has been criticised for its setup, in that the allocated timeframe only allows for superficial discussion of the large number of complex issues it is faced with, and the decisions needed on further steps. Furthermore, the focus on single SDGs without highlighting synergies and trade-offs, and subsequently the failure of initiating joint work programmes between sectors, has been criticised (Hege, 2018; Janetschek & Scholz, 2017).

Convened by the UN Secretary-General and the World Bank President in 2016, the **High-Level Panel on Water (HLPW)** had the task of providing leadership in addressing the crisis of global water governance, championing a comprehensive, inclusive and collaborative way of developing and managing water resources, improving water and

sanitation related services and accelerating progress on the implementation of SDG 6.⁵ The panel consisted of 11 heads of state and a special advisor. In preparation for the review of SDG 6 by the High-Level Political Forum, it called for the establishment of UN meetings on water at the highest possible level for better coordination, the consideration of a scientific panel on water, and using the UN-Water Action Decade as a platform for exchange and dialogue and the building of global partnerships (HLPW, 2018). As such, it reinforced many of the UNSGAB recommendations. The HLPW dissolved in 2018.

In addition, in November 2015 Cambodia, Colombia, Costa Rica, Estonia, France, Ghana, Hungary, Jordan, Kazakhstan, Morocco, Oman, Senegal, Slovenia, Spain and Switzerland launched the **Global High-Level Panel on Water and Peace**. It was tasked with developing a set of proposals aimed at strengthening the global framework to prevent and resolve water-related conflicts, and facilitate the use of water as an important factor of building peace and enhancing the relevance of water issues in national and global policymaking.⁶ Its final report, released in September 2017, calls for a Global Observatory for Water and Peace (GOWP) “to facilitate assistance to governments in using water as an instrument of cooperation, in avoiding tension and conflicts, and to build peace”. The GOWP would work closely with existing organizations at the global and regional level (Global High-Level Panel on Water and Peace, 2017).

3.4.3 International platforms and conferences

The international community has addressed the increasing global water crisis at various international conferences and knowledge platforms, resulting in a number of agreements and calls to action, starting with the United Nations Water Conference in 1977. The International Conference on Water and the Environment (Dublin Conference, 1992) concluded with four principles for IWRM, among others underlining the relevance of water as an economic good. In addition to this, a number of conferences without UN mandate complement the picture, e.g. the yearly Stockholm World Water Week, the triannual World Water Forums, organised by the World Water Council and the World Water Congresses of the International Water Resources Association. While these conferences contribute to setting the water agenda, they do not, for want of political high-level participation and mandate, serve as platforms for international decision-making related to water.

These conferences have been supplemented by the announcement of several decades for action, e.g. the International Drinking Water Supply and Sanitation Decade (1981–1990), the “Water for Life” International Decade for Action (2005–2015) in support of providing access to drinking water and sanitation as part of the MDGs and the International Decade for Action, “Water for Sustainable Development” (2018–2028). This current decade of action aims to achieve sustainable development and integrated management of water resources. This includes accelerating progress on SDG 6, in particular access to drinking water and sanitation, and efficient water use (United Nations, 2018c).

5 <https://sustainabledevelopment.un.org/HLPWater>, accessed 20 February 2019.

6 <https://www.genevawaterhub.org/resource/global-high-level-panel-water-and-peace-secretariat-0>, accessed 20 February 2019.

The OECD Initiative on Water Governance, created in 2009, is another important international platform. This multi-stakeholder network of about 100 representatives of public, private and non-profit organisations meets twice a year in a Public Policy Forum, developed good water-governance principles (OECD, 2015) and supports their implementation in several countries.

3.4.4 Private sector initiatives

The role of the private sector in water governance often provokes heated debates that date back to the adoption of the principle of water as an economic good in the *Dublin Statement on Water and Sustainable Development* at the International Conference on Water and the Environment in 1992. Opponents of a private-sector involvement in the provision of drinking water see the adoption of this principle as contradictory to the Human Right to Water (see Section 3.1.2). They fear that the companies' interests could contribute to further marginalising the poor by investing only in financially viable projects or regions, and that already high levels of corruption in the sector could increase further (Bakker, 2010; Lobina, 2017; WIN & WaterLex, 2013). Others argue for a greater involvement of private companies in mobilising necessary funding for construction, operation and maintenance of urgently needed water infrastructure, bringing in specialised technical and/or managerial expertise, or in taking on financial risk in large-scale infrastructure projects (Mandri-Perrott & Bisbey, 2016).

For the private sector, both risks and opportunities linked to the management of water resources are rising. So far, there is no formal policy at global or even international level on how to integrate the private sector into water governance, but two reasons point to the need for a more formal involvement and regulation: first, as Crow-Miller et al. (2017) note, agenda-setting actors like the World Bank currently return to large-scale infrastructure projects after a period of more cautious policies, especially related to the critical recommendations of the World Commission on Dams (WCD, 2000), as well as to highly contested public–private partnerships in drinking water. This is happening despite the latter undergoing a worldwide process of re-municipalisation (Lobina, 2017).

Second, new fields of private-sector intervention and new private actors – such as Chinese companies – emerge (Warner, Hoogesteger, & Hidalgo, 2017). New investment opportunities for private companies include water infrastructure and services for irrigation, desalination and groundwater development; but inter-basin transfers and flood protection systems also build upon new forms of public–private partnerships. Private-sector involvement also increases – and is advocated by policymakers – in the context of climate-change adaptation and SDG achievement. Yet, global norms or institutions to regulate private-sector activities in the water sector are missing. Examples of water being explicitly addressed in the international private sector are some trade agreements and specific private-sector initiatives.

Water is touched upon in several international trade institutions, namely in the WTO and regional free-trade agreements (e.g. the North American Free Trade Agreement). A major bone of contention is the question of whether general international trade regulations and respective liberalisation should also relate to trade in bulk water. Opponents of a liberalised water trade emphasise potential environmental, social and political risks, while proponents argue that water should be treated the same way as other natural – non-renewable –

resources. The interpretation of international trade rules that preponderates is that the export of bulk water is covered by neither the general free-trade rules of the World Trade Organization nor regional free-trade agreements (Muller & Bellmann, 2016).

A second heavily debated issue is whether the water service sector should be included in the international negotiations on liberalising the trade in services. In most countries, the provision of drinking-water services was considered a governmental affair. Concern is expressed that the General Agreement on Trade in Services (GATS) negotiations may put developing countries under pressure to liberalise water-service markets and to open national markets to foreign investors and operators – and that this would create negative impacts, in particular in least developed countries and countries with weak institutional structures (Alam, Mukhopadhyaya, & Randle, 2011)

Other initiatives provide for concrete options to promote sustainable water management. Positive examples are the Principles for Responsible Investment in Agriculture and Food Systems of 2014 (Committee on World Food Security, CFS), the New Framework for Decision-Making on Large Dams by the World Commission on Dams in 2000 and its subsequent initiatives on sustainability guidelines promoted by the International Hydropower Association. Under the Corporate Water Stewardship initiative, the World Wide Fund for Nature (WWF) collaborates with the private sector to enable concrete improvements in water management, in this case in 15 priority basins. Opportunities and risks of private-sector involvement are also analysed for specific domains of water management, such as the water, sanitation and hygiene (WASH) and irrigation sectors (Scheumann, Houdret, & Brüntrup, 2017; Schiffler, 2015).

At the global level, the World Water Council (founded in 1996) is one of the key actors funded by and representing the interests of the private sector. Critics of its World Water Vision Report and its triannual World Water Forums do not see it as a legitimate policymaking space since it has no governmental or intergovernmental mandate (Newton, 2014). Many authors (among them Dobner (2010)) and organisations fundamentally criticise the Council, as they see its agenda being shaped by the private sector, including by two of the world's largest water corporations, Suez and Veolia (Subramaniam, 2018). The Council has indeed failed to consider water as a fundamental human right, even after the right to water was explicitly recognised through the UN's Economic, Social and Cultural Committee and the UN General Assembly. The Alternative World Water Forum organised in parallel to the World Water Forum provides a different platform for the representation of civil society organisations, which do not find their interests represented at the World Water Forum.

All in all, it remains to be seen how global rules and mechanisms, and international finance institutions, can support effective government-led price and quality-control mechanisms and improve stakeholder participation in water issues affected by private-sector initiatives.

3.5 Gaps and demand for regulation

Despite the existence of international regimes and internationally agreed norms, paradigms and targets, institutional and organisational gaps exist. These include (1) the absence of a global framework convention for sustainable water governance; (2) the absence of a

mandated political forum for the discussion of water issues; (3) the insufficient global UN anchor of SDG 6 due to the weak mandate of UN-Water; and (4) a relatively weak basis for knowledge management and missing links between knowledge creation and policy implementation (interview, 5 Feb. 2019). Beyond this, there is arguably a demand for (5) a more honest approach of dealing with the private sector and (6) for improving linkages beyond the water sector.

First, there is the lack of a common definition of the problem and a common vision for the sustainable governance of global water resources, which results in incoherent and ineffective policies (Joyeeta Gupta & Pahl-Wostl, 2013). A central frame of reference such as a **global framework convention on sustainable water governance and management** (however unrealistic this may be) could provide such a vision, enhance the effectiveness and coherence of policy measures and serve as an entry point for coordinating with other sectors (Joyeeta Gupta & Pahl-Wostl, 2013). As mentioned in Section 3.1.1, the Berlin Rules by the ILA in 2004 are a first attempt to form a comprehensive international legal instrument, applying to surface and groundwater, both national and transboundary, to navigational and non-navigational uses, and to consider development needs and the protection of the resource. However, as with the Helsinki Rules, the Berlin Rules have no formal standing yet and are not legally binding. Whether the Berlin Rules have the potential and standing to become a centrepiece of global water governance remains to be seen.

Second, as mentioned above there is no mandated political forum for the discussion of water issues and thus a **lack of clear leadership** and high-level commitment for global water governance (Cooley et al., 2013). The many international conferences, forums, etc. currently in place lack the mandate and the high-level political participation needed for advancing the agenda on sustainable use and protection of global water resources, negotiating agreements and ensuring comprehensive reviews of progress on SDG 6 (interview, 5 Feb. 2019). For example, the first and so far the last high-level conference of the United Nations on water took place in 1977, namely the Mar del Plata conference (UN Water, 2018). Third, as discussed above the mandate of UN-Water is relatively weak. A report analysing the functions and capacities of the UN system identifies water and SDG 6 as one of the prominent gaps of the UN development system (Dalberg, 2017). The report states that in 2016 only 3 percent of the expenditure of the UN development system had been dedicated to SDG 6 – the most part of which went into emergency response and coordination by UNICEF – while water management issues and investment in water infrastructure were neglected. Topics with particular relevance for water as a global commons, such as the advancement of the normative framework, integrated management and water-use efficiency, are severely underfunded. This situation mirrors the fact that **SDG 6** (and access to water, sanitation and hygiene in particular) is **not represented by a central UN organisation**, and thus lacks an organisational anchor at the global level. If such a node existed, it could also serve as a node for interactions with other SDGs and as an entry point for linkages to external drivers such as trade and climate change (Joyeeta Gupta & Pahl-Wostl, 2013). In line with this, there is no review function for following up on the implementation of SDG 6 available at UN level. In fact, UN-Water is mandated with the monitoring of the implementation of SDG 6, but not with the associated review process.

Fourth, there is currently **no overarching assessment and review mechanism on global water resources**. The World Water Development Report coordinated by the World Water Assessment Programme on behalf of UN-Water aims to provide tools for a sustainable use

of our water resources by focusing on different strategic water issues each year. The WHO/UNICEF Joint Monitoring Programme reports on progress in meeting targets in Water Supply and Sanitation. The Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) by WHO provides a global analysis of the investments in sanitation, drinking-water and hygiene. Some of these efforts are currently being integrated in the Integrated Monitoring Initiative for SDG 6. However, there is no mechanism that documents and synthesises the current state and development of global water resources data based on a comprehensive review of the state of the art in research (GROW 2018). The GROW projects argue that we urgently need a more evidence-based approach to water-related decision-making. This approach should bring together science, policy and practice to provide synthesis on key water topics, consolidate knowledge on implementing the SDGs and thereby strengthen evidence-based decision-making.

The GROW projects therefore support the suggestion from the United Nations Secretary-General's Advisory Board on Water & Sanitation to set up a science platform on water for SDG implementation and recommend initiating a process designed to create such a platform.

Fifth, in the light of increasing private-sector involvement in water resources development and management, global water governance requires a more systemic, coherent and honest approach to **dealing with opportunities and risks of private-sector involvement**. Three principles for private-sector involvement could support such an endeavour: (i) it should contribute to securing long-term social and environmental viability of water resources management, and a use of public funding in this sense requires a clear regulatory framework for private-sector involvement; (ii) this needs to be based on solid and independent assessment of potential opportunities and trade-offs of this involvement; and (iii) design, implementation and monitoring of private-sector involvement in water mobilisation and management should be conducted in a participatory and transparent way.

Sixth, there is a lack of linkage between global water governance norms on the one hand and indirectly water-related issues such as trade on the other; water-related norms are often not part of regulations in other sectors. For enabling globally sustainable water use, other international regimes such as the WTO need to integrate issues such as water scarcity and pollution more explicitly (see also Section 3.4.4). For instance, the UN Watercourse Convention is not acknowledged in the world trade regime. The question remains how to coordinate with trade and climate change, and incorporate these issues into such regimes. This could be easier if there was a global framework of reference on how to govern water resources sustainably.

4 The role and contribution of Germany

At the international level, the German government cooperates closely with international water-related organisations (both within and outside the UN) as well as with other governments. The mandates for international cooperation in the water sector are divided between the BMZ, the BMU and the German Foreign Office, which work together closely on water issues. The BMZ, as the main donor organisation, is focusing on development cooperation, the BMU on issues of water and the environment, and the Foreign Office on water and international relations, security and peace (interviews, 29 Oct. and 5 Dec.2018).

In addition, the German Ministry of Education and Research (BMBF) supports applied research on water issues in several countries. Section 4.1 lays out contributions by Germany, while Section 4.2 focuses on contributions with Germany.

4.1 Contributions by Germany

For a long time, the water sector has been among the most supported sectors of German development cooperation, with the BMZ as its internationally recognised partner. Accordingly, for more than ten years, Germany has been one of the three largest bilateral donors in the water sector. Its long-term engagement has not only contributed to improving access to drinking water and sanitation, but has, among other things, supported water-sector reforms, cooperation on transboundary rivers, and partly also irrigation management.

Germany has also hosted important international events on international water governance. The 2001 “**Bonn International Conference on Freshwater**” was conceived as a preparatory meeting on freshwater issues for the World Summit on Sustainable Development (WSSD) in Johannesburg that took place a year later. The water related target of the Millennium Development Goal 7 (“To halve the proportion of the universal population without sustainable access to clean and safe drinking water and basic sanitation by 2015”) was prepared during the Bonn conference and successfully adopted at the WSSD. In 2011, and in preparation for the Rio+20 sustainability summit, the German government organised a conference on “**The Water-Energy-Food Security Nexus: Solutions for the Green Economy**” – highlighting and bringing the synergies, trade-offs and interlinkages of the water, energy and food-security sectors to the attention of politicians. This Nexus Conference provided new insights, but also showed the challenges associated with cross-sectoral coordination (BMU & BMZ, 2011). Conference results later provided important inputs to the UN Conference on Sustainable Development “Rio plus 20”. The conference further served as important preliminary work for addressing key interlinkages of the 17 SDGs. As a follow-up, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) still facilitates the Nexus Resource Platform⁷, supporting knowledge transfer and encouraging cross-sectoral cooperation.

In 2015, the Global Water Systems Project (GWSP), with the support of the German Ministry of Education and Research (BMBF), organised the international conference on the “**Sustainable Development Goals: A water perspective**”. Focusing on indicators, interlinkages and implementation of the future SDG on water, the conference provided a platform for interaction of the science community with the international policy process in the run-up of the SDG process. At this conference, the establishment of an “Intergovernmental Panel on Water” (to be modelled on the IPCC) was discussed to facilitate exchange between research and policy-making in the implementation process of SDG 6 and to provide a robust science base for the monitoring and review progress of the implementation of SDG 6 (GWSP, 2015). The BMBF furthermore promotes German science contributions to the implementation of SDG 6 through its funding line “Water as a Global Resource” (GROW).

7 <https://www.water-energy-food.org/nexus-platform-the-water-energy-food-nexus/>

However, BMZ commitments are stagnating or even decreasing in recent years. Between 2010 and 2016, commitments for the water sector (measured as the share of overall BMZ commitments) have been reduced by around one quarter, including a sharp decrease in Sub-Saharan Africa, a region suffering severely from lack of access to water and sanitation (Houdret, Janetschek, & Dombrowsky, 2017). In addition to this, the number of countries with a water focus in development cooperation has been and are further being reduced and the focus has shifted away from classic water issues such as access to drinking water and sanitation towards new crosscutting issues such as migration, climate change and biodiversity (interview, 29 Oct. 2018).

Nevertheless, as part of the **German Sustainable Development Strategy**, Germany has committed to contributing to the provision of an additional 10 million people annually with access to safe water and sanitation. In 2016, 11 million people gained access to these services with the support of the German development cooperation, thereby fulfilling this commitment (The Federal Government, 2016).

The 2017 **BMZ Water Strategy** provides guidance on the goals and priorities of German water-related development cooperation for all partners in this field and is binding for the BMZ and the implementing organisations, namely GIZ and KfW (BMZ, 2017). The strategy outlines the water-related activities of BMZ in the context of the overall goal of achieving the 2030 Agenda, with a particular focus on providing access to safe drinking water and sanitation, based on a rights-based approach.

However, the BMZ Water Strategy does not explicitly refer to water as a global common good. Instead, it refers to global commons in a more general way, such as the “responsibility for sustainable development and the global common good” (BMZ, 2017). Despite this, it puts much emphasis on the interlinkages of the SDGs, e.g. on the impact of efficient water management within the agricultural (SDG 2) and energy sectors (SDG 7) for protecting the global common good and for achieving SDG 6 (BMZ, 2017). With regard to the interlinkages with other sectors, it defines important aspects of cross-sectoral coordination in six annex documents.⁸ These documents were prepared in close cooperation with representatives from the respective sector departments within and governmental and non-governmental actors beyond BMZ. However, since the water strategy is still rather new, the extent to which it will succeed in improving cross-sectoral and cross-departmental coordination within the ministry and beyond remains to be seen. If successful, this concept might lend itself to an application to other SDGs. However, other governmental actors also implement water-related projects and are not bound to this strategy. The Foreign Office, for instance, is the main actor when it comes to water supply in situations of emergency and crisis response.

8 These concern (i) water, education, health, and food and nutrition; (ii) water, sustainable economic development, employment and vocational training; (iii) water, agriculture and energy; (iv) water, environment and climate change; (v) water, good governance, urban development; and (vi) water, population growth and migration (BMZ, 2017)

4.2. Contributions with Germany

In addition to its bilateral engagement, the BMZ supports a number of **international water initiatives**, such as UNSGAB, UN-Water, the Water Integrity Network (WIN), the Global Water Partnership (GWP), the Sustainable Sanitation Alliance (SuSanA), the Monitoring Initiative on water-related SDGs (GEMI) and the SDG 6 Synthesis Report as part of the World Water Assessment Programme (WWAP; (BMZ, 2018). In particular, the contributions to UN-Water, GEMI and the SDG 6 Synthesis Report are important with respect to implementing and reviewing SDG 6 and the perception of water as a global commons.

As mentioned before, from 2004 to 2015 the work of the **United Nations Secretary General's Advisory Board on Water and Sanitation (UNSGAB)**, was substantially supported by the German Government, namely BMZ, Foreign Office and GIZ. The former Parliamentary State Secretary of the BMZ, Ursula 'Uschi' Eid, significantly improved the visibility of water issues, both internationally and within Germany.

Building on the UNSGAB recommendations for improvements in global water governance (see Section 3.2.1), over the past years, Germany, together with a number of other governments, has been pro-actively engaged in promoting water issues and increasing the political recognition of water-related topics at the global level. At the World Water Week in 2015, a **core group** of countries was established in support of strengthening the global water governance architecture (including Finland, France, Germany, Hungary, the Netherlands and Switzerland; interviews, 5 Dec. 2018 and 5 Feb. 2019). Its main goals are to improve the global water governance architecture and to establish functional coordination mechanisms for global water governance. As the core group so far does not include non-European countries. It is therefore intended to transform this circle into a group of like-minded states from all UN-regions.

In the context of the core group, in 2018 Germany, Netherlands, South Africa and Singapore supported an **UN resolution** brought in by the Government of Tajikistan. This resolution was conceptualised as a follow-up to the 2017 resolution, which established the International Decade for Action, "Water for Sustainable Development" (2018–2028). This new resolution introduces a midterm review conference for the decade as well as a review of progress on SDG 6 as well as of interlinkages between SDG 6 and other SDGs. UN-Water is assigned an important role in preparing and facilitating not only the midterm conference in 2023 (including the drafting of the conference outcome document), but also a preparatory high-level meeting in 2021 (UN General Assembly, 2018). It remains to be seen, the extent to which UN-Water will be able to use this process and the room for manoeuvre it provides for initiating a meaningful and sustainable review process of SDG 6, thereby going beyond the monitoring role initially envisaged for the conference.

German activities at UN and other intergovernmental levels are closely coordinated between the Ministry of Environment (BMU), the Foreign Office and Ministry of Economic Cooperation and Development (BMZ). According to our interview partners, inter-ministerial cooperation between all three institutions works very well (interviews, 29 Oct., 5 Dec. and 11 Dec. 2018).

After more than 30 years of development cooperation in the water sector, and of Germany being one of the most important international funders in the sector, it is now crucial for the country to keep this position and further build on established networks and trust in order to further support achievements in international water governance and worldwide access to water and sanitation.

5 Transformation processes

Given the fragmentation of the global water governance architecture, the question arises, first, if there is a need to transform this structure and, if so, how to arrive at a more consistent, cohesive and effective system; second, what could the German government contribute to such a process.

Answers to these questions are even more important, since at the international level we currently observe a difficult political climate for multilateralism in general, and international collective action for the protection of the global water resources in particular. One sign of this is that between 2011 and 2016 global funding commitments to the water sector decreased by more than 25 percent (United Nations, 2018b).

Political commitment to water as a global common good has declined even more. Governments tend to insist on their national sovereignty when it comes to the governance of water resources, arguing that there is a need to implement the SDGs and govern water resources at the basin and local level. However, as shown above, certain aspects of water governance require concerted global action and coordination. This is even more the case as today societies are embedded in broad sets of processes and systems, some of which are beyond the authority and influence of single national governments such as climate change, global economic production patterns, consumption, and trade. These aspects require coordination at higher levels of governance and adjustments to the global economy (Hoekstra, 2011).

One proposal to address such global interdependencies with direct impacts on water is to include currently externalised costs of food production in the production costs, for instance through adjustments to water prices. It is assumed that this would reduce demand for producing water-intensive goods where water is scarce, but may also severely affect the livelihoods of smallholders. Concepts to address these issues include virtual water taxes, an international water label and a water-footprint trading scheme. The latter, for example, could be useful not only to assess water needs of certain products, but also the impact of this consumption on water-scarce countries and regions.

Yet, a global approach to including the cost of water in the price charged for agricultural goods is not likely. Reasons include the complexity of international trade and related national interests, the difficult political economy of water pricing reforms, in particular in the agricultural sector (Dinar, 2000; Dinar & Saleth, 2005), as well as uncertainty related to the real impact of the above instruments on water savings (which in many cases are actually reinvested for the intensification or extension of irrigated areas). Nevertheless, there is considerable progress in including the impacts of water use in an exporting country as an indicator of sustainable production in labels – an approach that could be extended and brought more actively into the public debate on sustainable consumption. However, these

aspects are currently hardly touched upon by the 2030 Agenda and SDG 6, and related interlinkages are so far underrepresented in the review of the HLPF (Hege, 2018).

Hence, there is a need for a common vision, political buy-in, visibility, policy coherence and entry points for coordination with other issues such as trade and climate change. Ideally, this would be achieved through the combination of a single global normative framework, such as a global framework convention on water and a single organisation responsible for all water-related issues at the global level.

In terms of the institutional structure, a **global framework convention on water**, such as the Berlin Rules as suggested by the ILA in 2004, would provide a vision, guidelines and principles on sustainably governing water resources, around which interested nations can then develop legal frameworks for governing water resources at basin level and beyond. However, such a regime is politically highly unlikely to be achieved – even in the longer term – as long as nation states insist on their sovereignty, in particular in relation to transboundary issues. In addition to this, it is questionable whether a global water governance regime would be an appropriate tool for addressing the issues at hand. Conca argues that international regimes are based on state authority and are mainly successful in solving global problems with local solutions (Conca, 2006). However, as mentioned above, the protection of freshwater as a global common resource would among other things require the change of trade and consumption patterns – issues, which are not (only) in the hands of single national governments.

In terms of the organisational structure, a **single global water organisation** with strong regulatory and procedural power, covering all aspects of water governance currently addressed by numerous UN agencies would at least theoretically be most effective. However, this option is neither politically feasible, since UN agencies are unwilling to give up funds for governing water issues, nor practically possible due to the crosscutting nature of water issues and the complexity of the issue.

The focus, then, has to be on second-best mechanisms for strengthening the global voices for protecting global water resources without a central convention on water or a central coordinating agency for implementing cross-sectoral coordination at the global level. In the following, we distinguish between short-term (Section 5.1), medium-term (Section 5.2) and long-term (Section 5.3) goals and options for increasing the coordination and cooperation of water governance entities at the global level.

5.1 Short-term options

Short-term options include using the decade of action, and particularly the preparatory meeting and mid-term conference, for lobbying and forging alliances for the options listed below and for accelerating progress towards the achievement of SDG 6, including strengthening the interlinkages between the water-related SDGs (interview, 11 Dec. 2018).

In the absence of regular high-level meetings on water issues, the preparatory meeting in 2021 and the mid-term conference of the decade for action in 2023 should be used as platforms for such meetings to discuss water issues and joint development of a way forward (interview, 5 Dec. 2018). Germany and the other core group members could use these events

for enlarging the group of countries (particularly with a focus on G77 members) favouring a reform of the global water governance architecture.

The setup of the mid-term conference could be modelled on the successful high-level UN Oceans Conference in 2017. It leveraged support for the implementation of SDG 14, and raised financial commitments of USD 25.5 billion (UN Water, 2018). The **Water Conference** could provide a platform for engagement of the water sector with other sectors and issues, enable linkages of SDG 6 with other agendas such as climate change (UNFCCC), mobilise political support and finance, prepare an outcome document as input to the HLPF, and pave the way for establishing a regular follow-up and review of SDG 6 (UN Water, 2018).

Such a review should put more emphasis on the **interlinkages of the SDGs**. Germany could advocate for making these interlinkages a prominent topic at the 2021 preparatory meeting and at the 2023 Water Conference, for example at the next UN-Water meeting in August 2019. Germany could further consider how far the BMZ Water Strategy, and particularly its annexes covering crosscutting issues, could serve as a blue print for addressing the interlinkages of the water-related SDGs. Last, but not least, the recent uplifting of the SDG implementation to the level of the State Secretary at BMZ shows a high concern for efficient implementation, including in partner countries. Given the numerous interlinkages between different SDGs and water issues, the water strategy should also play a key role in the SDG process and in helping to mainstream water issues across sectoral development projects.

5.2 Medium-term options

The options for transforming the global water governance architecture in the medium term include the strengthening of UN-Water and the perpetuation of high-level meetings at UN level.

Stronger coordination at the international level requires a strong **coordinating agency**. Some UN organisations, such as UNESCO, aspire to take over this central role. However, since they do not cover the whole range of water issues, but are only mandated with special aspects of water governance, this does not seem to be a good option (interview, 5 Dec. 2018). Even more so since with **UN-Water** there is an actor in place for this task, who can resort to a comprehensive network of actors both within and outside the UN. Even though UN-Water has often been criticised for its weakness due to structural constraints, it has recently gained standing, influence and convening power (Swann & André, 2018). UN-Water's role in preparing the UN Water and Sanitation Conference in 2023 can further contribute to its strengthening. UN-Water therefore has the potential to develop its role as a bridging organisation between UN and non-UN actors, as well as between knowledge platforms and conferences and the political arena. This could be supported by opening the decision-making process at UN-Water (which is taking place in closed sessions) to member states, UN-Water partners and NGOs, which could improve the political buy-in and transparency (Swann & André, 2018).

To date there is no institutionalized high-level gathering of UN members for discussing progress on SDG 6, apart from the HLPF. Therefore, in terms of sustaining political will and increasing leadership and visibility, the HLPW has recommended establishing UN

meetings at the highest possible level (UN Water, 2018). In the absence of a full-fledged intergovernmental body on water (Section 5.3), this could be achieved by perpetuating the format of the High-Level Panel on Water or by establishing an advisory group of water governance officials modelled on UNSGAB. Both would be politically comparatively easy to achieve, since it would not necessarily require a UN mandate. But it would also be limited in scope, because of the lack of mandate and because, given the complexity of the issue, such a limited group might not be the best option (J. W. Dellapenna, Gupta, Li, & Schmidt, 2013). However, it could serve as a moderator between science and policy, who brings important topics to the table (interview, 5 Feb. 2019).

Lastly, there is currently no assessment and review mechanism on global water resources. Such a global **Scientific and Practice Panel on Water** would go beyond the World Water Assessment Programme's yearly World Water Development Report (highlighting a certain topic) in that it documents and synthesises the current state and development of global water resources as far as possible at the river basin, country and global levels. It should integrate the data of the different UN-water initiatives, such as the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS), and the Integrated Monitoring Initiative for SDG 6, but also directly collect other data needed at national levels and assess the state of the art in water research. By providing policy options, such a Panel could help bridge the gap between science and politics, foster knowledge transfer and help to base political decisions on scientific evidence (Nakicenovic et al., 2016).

5.3 Long-term options

The long-term options include installing an intergovernmental body on water, a Commission on Water and/or a Special Representative on Water at UN level.

Much of the weakness of UN-Water is rooted in the lack of an **UN Intergovernmental Body on Water**, which would serve as a platform for exchange among water ministers, and would have the authority and mandate to take decisions on water matters at UN level (interview, 29 Nov. 2018). Such a body, supported by UN-Water, could increase political traction, raise water on the international agenda, foster the regular exchange of ideas and improve visibility of the topic among policy makers. It could also promote coherence and advocate for priorities (Rizzotti, 2017; Swann & André, 2018; United Nations, 2015). However, since the promotion of such a body by the so-called core group (among them Germany) was internationally met with scepticism (one argument being that there is the risk of duplicating structures), its establishment does not seem realistic at the moment (interview, 29 Oct. 2018).

The two other options, establishing a UN Commission for Water and appointing a Special Representative on Water, have been put forward by the external review of UN-Water, but have not yet been widely discussed. Such as other UN Commissions, a **UN Commission for Water** linked to UN-Water would have the advantage of providing close links to the member states and of directly reporting to the HLPF and the United Nations Economic and Social Council (ECOSOC) (Swann & André, 2018).

A **Special Representative** would be appointed by the UN Secretary General to generate high-level political support for water issues – similar to the role played by the Special Representative on Energy and the Special Advisor on Gender Issues (Swann & André, 2018). It could increase the visibility and political traction of water issues, but would not serve the goal of involving member states and ministers at the global level.

Regarding the institutional setting, in the long term and with growing membership, the **UN Watercourse Convention** as well as **UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes** might evolve towards something like a global framework for transboundary water governance. In addition, the important WASH dimension is covered by the **Human Right to Water and Sanitation** and SDG 6, which can serve as global frames of reference for WASH.

6 Conclusion

For decades, freshwater resources have mainly been governed at the local level, with a few treaties between riparian states being the exception. However, global developments such as climate change, the impacts of global consumption and trade patterns, urbanization and population growth on local water resources, and the emergence of global norms and paradigms, call for improved global water governance. Water resources not only play a central role for long-term global sustainability and development, but also for stabilising the Earth system. Consequently, this study supports the notion that global freshwater resources fulfil the function of a new global commons (Nakicenovic et al., 2016).

Nevertheless, the precise nature and design of an appropriate global regime for protecting this new common good remains unclear. Its implementation may also be challenged by conflicting property rights of individuals and nation states and issues of national sovereignty.

This paper's analysis of the current global water governance architecture reveals a highly fragmented and incoherent regime consisting of numerous norms, paradigms and actors, each covering single aspects of global water governance. Given the diversity of issues and interests, a "classical" formation of one comprehensive international water regime in the form of a framework convention has so far not emerged. While specific global governance institutions do exist for other global commons such as climate stability, biological diversity, land degradation/ desertification and the protection of the ozone layer, there is no central institution at the core of the global water governance architecture.

In spite of numerous appeals and international statements on the perceived water crisis in quantitative and qualitative terms, water issues are not well represented at the global level and do not range high on the international agenda. This may be due to the cross-cutting nature of water, the piecemeal structure – the diversity of water problems and of efforts to address them – and the fear of some countries that global approaches could affect sovereignty.

Instead, diverse governmental, private sector and civil society actors have taken different initiatives to promote their interests in water management. Integrated Water Resources Management (IWRM) has emerged as a dominant global paradigm, but even in this case its

global governance does not reach beyond incomplete monitoring initiatives. The adoption of SDG 6 now provides for a more comprehensive approach than the previous Millennium Development Goal, which only focused on water supply, sanitation and hygiene. Nevertheless, the SDGs fail explicitly to address the resource as a global commons; and SDG 6 aims to tackle water problems at the river basin, national and to some degree, at the transboundary levels.

In the face of the fragmentation of global water governance, Gupta (2014) calls for a flexible global normative framework that acknowledges the external drivers and pressures on water resources, but at the same time allows for a contextualisation and adaptation of this framework to local/basin needs (so-called *glocal* water governance (Gupta, 2014)). Given the truly global challenge and the character of water as a global common good, the authors of this study, however, argue that we even need to go beyond better *glocalised* water governance and also strengthen certain global aspects of water governance.

Due to the political realities and the currently very limited room for manoeuvre in the realm of global water governance analysed in Section 5, we do not suggest a new normative framework. A more feasible option seems to be a global governance regime that evolves from the improved interplay of the existing (and potentially improved) elements of global water governance (i.e. norms, targets, paradigms and actors), complemented by certain innovations at UN level. Such an approach that combines existing global norms and joint guidelines to be adapted to local contexts and needs may be able to increase urgently needed political support for governing water as a global commons.

In the view of the authors, such a global water governance regime and related policies and research should:

➤ **Build on the norms of the UN Watercourse Convention and the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes**

The UN Watercourse Convention ratified in 2014 codifies the principles of equitable and reasonable utilisation, avoidance of significant harm and prior notification and highlights the procedural obligations of prior notification and cooperation with other watercourse states. In addition, the UNECE Convention has reached the status of a global convention through opening up for membership from around the world. It covers several additional aspects of sustainable water governance and water protection. It also has a number of standing bodies that take up urgent issues and new developments. Important norms embedded in the convention and its protocols refer not only to transboundary water bodies, but also to the human right to water (such as the UNECE-WHO/Europe Protocol on Water and Health) and other topics of SDG 6.

➤ **Strengthen the UN water architecture**

A global water governance regime should aim at a more efficient coordination among paradigms, targets and actors. At present UN-Water is (despite its weaknesses) best positioned to fulfil this task at the global level. It should however be strengthened in two ways. First, data assessment that is already very much concentrated in its hands should be more comprehensive, regular and global than the currently highly dispersed information

available in the different reports and review mechanisms (see also Section 5.2). Therefore, it is suggested to establish a **Scientific and Practice Panel on Water**, similar to the IPCC.

Second, political support for the institution and related policy processes needs to increase. One way to achieve this could be high-level meetings of ministers (and even heads of state) supported by UN-Water, which would allow for improved intergovernmental exchange and decision-making at the global level. Equipped with true decision-making power and meaningful review mechanisms of policy implementation, this could provide a much more effective global forum than the many international gatherings with limited follow-up and decision-making power, such as the World Water Forums. Therefore, this study recommends the set-up of an **Intergovernmental Body on Water** within the UN system, or – as long as this is not possible – a UN Water Committee, a Special Representative, a high level panel or advisory group.

However, the strengthening of the UN water architecture can only succeed if based on broad political support from the OECD and from developing countries. Germany can and should make use of its longstanding reputation in bi- and multilateral cooperation in the water sector to promote this initiative in partner countries and at the international level.

➤ **Broaden the global water governance perspective to include trade, climate change, SDGs, and to strengthen efforts to reduce water pollution**

Conceiving of water as a global commons also requires looking beyond existing water institutions and organisations in order to include new domains, institutions and actors. The global and local implications of globalised trade and consumption patterns, and of climate change on water, have been insufficiently assessed and represented in debates around global water governance and related policy options. Furthermore, water has been inadequately addressed in trade agreements, and the UNFCCC and the Paris Agreement.

Further research with the aim of a comprehensive analytical account of this segment of fragmentation and the needed entry points for trade- or climate change-related aspects to global water governance is needed. One example of such a new trend is global agricultural trade and foreign direct investments in agricultural land and associated access to water resources, which have stimulated debates on the unequal endowments of countries with water, and on how to secure and improve water rights. Since many countries (and their consumers) increasingly externalise their water footprints to other parts of the world due to international trade, several economic instruments have been suggested (see also Section 5; (Hoff, 2009; Hoekstra, 2010)). It is worth evaluating whether and under which conditions these global instruments and standards would be adequate and feasible, and how they would fit within the global trade and food security architectures. Further research needs to scrutinise global mechanisms and incentives, which may strengthen the regulatory capacity of national institutions, and the application of global norms and environmental and social safeguards by international finance institutions (developmental as well as commercial) and transnational companies. These issues do not only relate to the water sector.

Other examples pointing to the need for broadening the concept of global water governance are climate change, and the SDG process. The fact that climate change affects Earth system resilience inter alia through water resources may require greater attention to water issues in the context of UNFCCC and the Paris Agreement. Moreover, the SDG process as *the* global policy process for sustainable development should be actively used and promoted to

highlight water issues. Not only is sustainable water management a prerequisite for achieving many of the goals but, due to the interconnectedness of water with other sectors, achieving SDG 6 also depends on a successful mainstreaming of water issues in many of the other goals. International efforts should be strengthened to address the universal and increasing problem of water pollution. Still, about 80 percent of the world's wastewater is released, in most cases untreated, into the environment, rivers, lakes, and oceans. This not only affects water supply and living conditions in general, but even water use in sectors that cause water pollution. BMZ's water strategy shows the many interlinkages between the resource and other SDGs (see Section 4.1). It could be a good starting point for enhancing understanding on the matter and related policy coherence by and through the German government in the international SDG process.

Overall, current trends in water availability, quality and demand, as well as increasingly globalised interlinkages between different resource uses, urgently require increased consciousness about water resources as a global commons, and concrete advances in global water governance to preserve them. Given the current difficulties for achieving global consensus on safeguarding water resources and the lack of political support in many countries, this goal can probably only be achieved in small steps and with the continued support of a number of dedicated countries.

References

- Alam, S., Mukhopadhyaya, P., & Randle, D. (2011). The general agreement on trade in services (GATS), water, and human rights from the perspective of developing countries. *Netherlands International Law Review*, 58(1).
- Allan, A., Tignino, M., & Loures, F. (2011). The role and relevance of the draft articles on the law of transboundary aquifers in the European context. *Journal for European Environmental & Planning Law*, 8(3), 231-251. doi:<https://doi.org/10.1163/187601011X576197>
- Allan, J. A. (2003). *IWRM/IWRAM: A new sanctioned discourse?* (Occasional Paper 50, SOAS Water Issues Study Group). London: University of London.
- Allan, T. (2001). *The Middle East water question: Hydropolitics and the global economy* London, New York: I.B. Tauris.
- Bakker, K. J. (2010). *Privatizing water. Governance failure and the world's urban water crisis*. Ithaca, United States Cornell University Press.
- Baumgartner, T., & Pahl-Wostl, C. (2013). UN-water and its role in global water governance. *Ecology and Society*, 18(3). doi: <http://dx.doi.org/10.5751/ES-05564-180303>
- Biermann, F. (2012). Planetary boundaries and earth system governance: Exploring the links. *Ecological Economics*, 81, 4-9. doi:10.1016/j.ecolecon.2012.02.016
- Blomqvist, L., Nordhaus, T., & Shellenberger, M. (2012). *The planetary boundaries hypothesis: A review of the evidence*. Oakland, CA: BreakThrough Institute. DOI: 10.13140/RG.2.1.2149.2649
- BMU (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) & BMZ (Federal Ministry for Economic Cooperation and Development). (2011, 16.-18.11.2011). *Messages from the Bonn2011 Conference: The water, energy and food security nexus – solutions for a green economy*. Paper presented at the Bonn2011 Conference.
- BMZ (Federal Ministry for Economic Cooperation and Development). (2017). *BMZ water strategy: A key contribution to implementing the 2030 Agenda and the Paris Agreement*. Retrieved from https://www.bmz.de/en/publications/type_of_publication/strategies/Strategiepapier390_08_2017.pdf
- BMZ. (2018). *German development cooperation in the water sector*. Bonn: Author.
- Cobos, G. I. (2002). The aquifer recharge system of Geneva (Switzerland): A 20 year successful experience. In P. Dillon (Ed.), *Management of aquifer recharge for sustainability* (pp. 49-52). Adelaide: Balkema.
- Conca, K. (2006). *Governing water. Contentious transnational politics and global institution building*. Cambridge, MA: The MIT Press.
- Cooley, H., Ajami, N., Ha, M.-L., Srinivasan, V., Morrison, J., Donnelly, K., & Christian-Smith, J. (2013). *Global water governance in the 21st century*. Oakland, CA: Pacific Institute.
- Cosgrove, W. J., & Rijsberman, F. R. (2000). *World water vision: Making water everybody's business*: World Water Council.
- Crow-Miller, B., Webber, M., & Molle, F. (2017). The (re)turn to infrastructure for water management? *Water Alternatives*, 10(2), 195-207.
- Dalberg. (2017). *System-wide outline of the functions and capacities of the UN development system*. Retrieved from https://www.un.org/ecosoc/sites/www.un.org.ecosoc/files/files/en/qcpr/sg-report-dalberg_unds-outline-of-functions-and-capacities-june-2017.pdf
- Dellapenna, J., & Gupta, J. (2008). Toward global law on water. *Global Governance*, 14(4), 437-453.
- Dellapenna, J. W., Gupta, J., Li, W., & Schmidt, F. (2013). Thinking about the future of global water governance. *Ecology and Society*, 18(3). doi: <http://dx.doi.org/10.5751/ES-05657-180328>
- Dinar, A. (2000). *The political economy of water pricing reforms*. New York: Oxford University Press.

- Dinar, A., & Saleth, R. M. (2005). Issues in water pricing reforms: From getting correct prices to setting appropriate institutions. In H. P. Folmer & T. Tietenberg (Eds.), *The international yearbook of environmental and resource economics 2005/2006* (pp. 1-51). Cheltenham: Edward Elgar.
- Dobner, P. (2010). *Wasserpolitik – zur politischen Theorie, Praxis und Kritik globaler Governance* Berlin: Suhrkamp.
- Dombrowsky, I. (2004). Is water a public good? In I. Dombrowsky, H. Wittmer, & F. Rauschmayer (Eds.), *Institutionen in Naturschutz und Ressourcenmanagement – Beiträge der neuen Institutionenökonomik. Ergebnisse eines Workshops am 26./27. Juni 2003 am Umweltforschungszentrum (UFZ) in Leipzig. UFZ-Bericht Nr. 7/2004* (pp. 54-71). Leipzig: UFZ-Umweltforschungszentrum Leipzig-Halle.
- Dombrowsky, I. (2007). *Conflict, cooperation and institutions in international water management. An economic analysis*. Cheltenham UK and Northampton, MA, USA: Edward Elgar.
- Dombrowsky, I., Hagemann, N., & Houdret, A. (2014). The river basin as a new scale for water governance in transition countries? A comparative study of Mongolia and Ukraine. *Environmental Earth Sciences*, 72(12), 4705–4726. doi:10.1007/s12665-014-3308-4
- Dombrowsky, I., & Hensengerth, O. (2018). Governing the water-energy-food nexus related to hydropower on shared rivers—the role of regional organizations. *Frontiers in Environmental Science*, 6(153), 1-16. doi:10.3389/fenvs.2018.00153
- European Parliament and Council. (2000). Directive on establishing a framework for community action in the field of water policy.
- European Parliament and Council. (2006). Directive on the protection of groundwater against pollution and deterioration.
- European Union. (2012). *European report on development, confronting scarcity: Managing water, energy and land for inclusive and sustainable growth*. Belgium: Author.
- Giordano, M., & Shah, T. (2014). From IWRM back to integrated water resources management. *International Journal of Water Resources Development*, 30(3), 364-376. doi:https://dx.doi.org/10.1080/07900627.2013.851521
- Global High-Level Panel on Water and Peace. (2017). *A matter of survival*. Geneva: Geneva Water Hub.
- GROW (Water as a Global Resource). (2018). *GRoW position paper on SDG6. Strengthening the evidence base for the SDG process*. Retrieved from http://publications.iass-potsdam.de/pubman/item/escidoc:4001904:4/component/escidoc:4001905/grow_sdg_6_position_paper_20180607_final_v2.pdf
- Gupta, J. (2014). ‘Glocal’ politics of scale on environmental issues: Climate change, water and forests. In F. Padt, P. Opdam, N. Polman, & C. Termeer (Eds.), *Scale-sensitive governance of the environment*. John Wiley & Sons. DOI: <https://doi.org/10.1002/9781118567135.ch9>
- Gupta, J. (2016). The watercourses convention, hydro-hegemony and transboundary water issues. *The International Spectator*, 51(3), 118–131.
- Gupta, J., & Pahl-Wostl, C. (2013). Global water governance in the context of global and multilevel governance: Its need, form, and challenges. *Ecology and Society*, 18(4). doi: <http://dx.doi.org/10.5751/ES-05952-180453>
- GWP (Global Water Partnership). (2000). *Integrated water resources management*. Retrieved from <http://www.gwpforum.org/gwp/library/TACNO4.PDF>
- GWSP (Global Water Systems Project). (2015). *Sustainable development goals: A water perspective – summary report and extended recommendations of the Bonn Conference 2015: Indicators, interlinkages and implementation*. Retrieved from <https://collections.unu.edu/eserv/UNU:3377/GWSPConference.pdf>
- Hege, E. (2018). *High-Level Political Forum 2018: Unsatisfying results*. Retrieved from <https://www.iddri.org/en/publications-and-events/blog-post/high-level-political-forum-2018-unsatisfying-results>

- Hensengerth, O. (2015). Where is the power? Transnational networks, authority and the dispute over the Xayaburi dam on the lower Mekong mainstream. *Water International*, 40(5-6), 911-928. doi:10.1080/02508060.2015.1088334
- HLPW (High Level Panel on Water). (2018). *Making every drop count: An agenda for water action*. Retrieved from https://sustainabledevelopment.un.org/content/documents/17825HLPW_Outcome.pdf
- Hoekstra, A. Y. (2011). The global dimension of water governance: Why the river basin approach is no longer sufficient and why cooperative action at global level is needed. *Water*, 2011(3), 21-46. doi:10.3390/w3010021
- Hoff, H. (2009). Global water resources and their management. *Current Opinion in Environmental Sustainability*, 1(2), 141-147.
- Hooper, B. (2003). Integrated water resources management and river basin governance. *Water Resources Update*, 126 12-20.
- Horlemann, L., & Dombrowsky, I. (2012). Institutionalising IWRM in developing and transition countries – the case of Mongolia. *Environmental Earth Sciences*, 65(5), 1547–1559. doi:DOI: 10.1007/s12665-011-1213-7
- Houdret, A., Janetschek, H., & Dombrowsky, I. (2017). Wasser marsch! Wasser – ein wichtiger Hebel der Agenda 2030. Retrieved from <https://blogs.die-gdi.de/2017/08/24/wasser-marsch/>
- Huitema, D., & Meijerink, S. (2014). The politics of river basin organizations: Institutional design choices, coalitions and consequences. In D. Huitema & S. Meijerink (Eds.), *The politics of river basin organisations. Coalitions, institutional design choices and consequences* (pp. 1-38). Cheltenham, UK/ Northampton, USA: Edward Elgar Publishing.
- ILA (International Law Association). (2004). *Berlin conference: Water resources law* (fourth report). Retrieved from http://www.internationalwaterlaw.org/documents/intldocs/ILA_Berlin_Rules-2004.pdf and http://www.internationalwaterlaw.org/documents/intldocs/ila_berlin_rules_dissent.html
- IUCN (International Union for Conservation of Nature and Natural Resources), UNEP (United Nations Environment Programme), & WWF (World Wide Fund for Nature). (1980). *Living resource conservation for sustainable development*. Retrieved from <https://portals.iucn.org/library/sites/library/files/documents/WCS-004.pdf>
- Janetschek, H., & Dombrowsky, I. (2017). *Wasser – ein „blauer“ Faden zieht sich durch die Agenda 2030 und das Klimaabkommen von Paris* (Die aktuelle Kolumne vom 28.08.2017). Bonn: German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE).
- Janetschek, H., & Scholz, I. (2017). *Bestandsaufnahme Agenda 2030: Kommen wir in der integrierten Umsetzung voran?* (Die aktuelle Kolumne vom 24.07.2017). Bonn: German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE).
- Jaramillio, F., & Destouni, G. (2015). Comment on “planetary boundaries: Guiding human development on a changing planet”. *Science*, 348(6240).
- Jensen, K. M. (2013). Viewpoint – swimming against the current: Questioning development policy and practice. *Water Alternatives*, 6(2), 276-283.
- Kirschner, A. J. (2011). The human right to water and sanitation. In A. von Bogdandy & R. Wolfram (Eds.), *Max Planck Yearbook of united national law 15* (pp. 445-487). The Netherlands: Koninklijke Brill N.V.
- Lobina, E. (2017). Water remunicipalisation: Between pendulum swings and paradigm advocacy. In S. Bell, A. Allen, P. Hofmann, & T.-H. Teh (Eds.), *Urban water trajectories* (pp. 149-161). London, UK: Springer International Publishing.
- Mandri-Perrott, C., & Bisbey, J. (2016). *How to develop sustainable irrigation projects with private sector participation*. Washington, DC: World Bank.
- McCaffrey, S. (2003). *The law of international watercourses. Non-navigational uses*. Oxford: Oxford University Press.

- MEA (Millennium Ecosystem Assessment). (2005). *Ecosystems and human well-being: Wetlands and water*. Washington, DC.: World Resources Institute.
- Meijerink, S., & Huitema, D. (2017). The institutional design, politics, and effects of a bioregional approach: Observations and lessons from 11 case studies of river basin organizations. *Ecology and Society*, 22(2), 41.
- Mekonnen, M. M., & Hoekstra, A. Y. (2016). Four billion people facing severe water scarcity. *Science Advances*, 2(2). doi:DOI: 10.1126/sciadv.1500323
- Molden, D. (2009). Planetary boundaries: The devil is in the detail. *Nature Reports Climate Change*, 116. doi:10.1038/climate.2009.97
- Molle, F. (2008). Nirvana concepts, narratives and policy models: Insights from the water sector. *Water Alternatives*, 1(1), 131-156.
- Muller, M., & Bellmann, C. (2016). *Trade and water: How might trade policy contribute to sustainable water management?* Geneva: International Centre for Trade and Sustainable Development (ICTSD).
- Nakicenovic, N., Rockström, J., Gaffney, O., & Zimm, C. (2016). *Global commons in the anthropocene: World development on a stable and resilient planet* (IIASA Working Paper). Retrieved from https://www.iucn.org/sites/dev/files/global_commons_in_the_anthropocene_iiasa_wp-16-019.pdf
- Newton, J. T. (2014). *“Water, water everywhere, nor any drop to drink”: An exploration of the lack of a formal global water governance regime*. Tufts University.
- OECD (Organisation for Economic Cooperation and Development). (2015). *OECD principles on water governance*. Retrieved from <http://www.oecd.org/cfe/regional-policy/OECD-Principles-on-Water-Governance-brochure.pdf>
- OECD. (2011). *Water governance in OECD countries: A multi-level approach*. Paris: Author.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. New York: Cambridge University Press.
- Ostrom, V., & Ostrom, E. (1977). Public goods and public choices. In M. D. McGinnis (Ed.), *Polycentricity and local public economies: Readings from the workshop in political theory and policy analysis, 1999* (pp. 75-103). Ann Arbor: The University of Michigan Press.
- Pahl-Wostl, C., Gupta, J., & Petry, D. (2008). Governance and the global water system: A theoretical exploration. *Global Governance: A Review of Multilateralism and International Organizations*, 14(4), 419-435. doi:10.5555/ggov.2008.14.4.419
- Rahaman, M. M., & Varis, O. (2005). Integrated water resources management: Evolution, prospects and future challenges. *Sustainability: Science, Practice, & Policy*, 1(1), 15–21.
- Rieu-Clarke, A. S. (2008). The role and relevance of the UN convention on the law of the non-navigational uses of international watercourses to the EU and its member states. *British Yearbook of International Law*, 78(1), 389-428. doi:10.1093/bybil/78.1.389
- Rizzotti, N. (2017). *A more effective global water architecture*. Retrieved from <https://www.shareweb.ch/site/Water/resources/Documents/UN%20global%20water%20governance.pdf>
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S. I., Lambin, E., ...Foley, J. (2009). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society*, 14(2), 1-33.
- Salman, S. M. (2007). The Helsinki rules, the UN watercourses convention and the Berlin rules: Perspectives on international water law. *Water Resources Development*, 23(4), 625-640.
- Salman, S. M. A. (2007). The United Nations watercourses convention ten years later: Why has its entry into force proven difficult? *Water International*, 32(1), 1-15. doi:10.1080/02508060708691962
- Samuelson, P. A. (1954). The pure theory of public expenditure. *Review of Economics and Statistics*, 36, 387–389.
- Scheumann, W., Houdret, A., & Brüntrup, M. (2017). *Unlocking the irrigation potential in sub-Saharan Africa: Are public-private partnerships the way forward?* (Briefing Paper 7/2017). Bonn: German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE).

- Schiffler, M. (2015). *Water, politics and money. A reality check on privatization*. Springer International Publishing.
- Schmeier, S. (2013). *Governing international watercourses: River basin organizations and the sustainable governance of internationally shared rivers and lakes*. Abingdon: Routledge.
- Schmeier, S., Gerlak, A., & Blumstein, S. (2016). Clearing the muddy waters of shared watercourses governance: Conceptualizing international river basin organizations. *International Environmental Agreements: Politics, Law and Economics*, 16(4), 597-619. doi:10.1007/s10784-015-9287-4
- Schmidt, F. (2012). *Auf dem Weg zu einem globalen Wasserregime: Regimetheoretische Erklärungen und praktische Anforderungen nach 30 Jahren globaler Wasserpolitik*. Berlin: Freie Universität Berlin.
- Subramaniam, M. (2018). Controlling water resources from “above”: Global water forums. In M. Subramaniam, *Contesting water rights: Local, state and global struggles* (pp. 95-152). Cham: Palgrave Macmillan.
- Swann, P., & André, N. (2018). *External review of UN-water: Final report*.
- The Federal Government. (2016). *German sustainable development strategy*. Retrieved from <https://www.bundesregierung.de/resource/blob/997534/418554/b428f6c54e1dc6f829da02325648fd2f/2017-04-12-kurzpapier-n-en-data.pdf?download=1>
- United Nations. (2010a). *The human right to safe drinking water and sanitation*. A/HRC/RES/15/9. New York: Author.
- United Nations. (2010b). *The human right to water and sanitation: Resolution adopted by the General Assembly, A/RES/64/292*. Retrieved from <https://www.refworld.org/docid/4cc926b02.html>
- United Nations. (2015). *The UNSGAB journey*. United Nations Secretary-General’s Advisory Board on Water and Sanitation (2004-2015). New York: Author.
- United Nations. (2018a). *Sustainable Development Goal 6 synthesis report 2018 on water and sanitation*. New York: Author.
- United Nations. (2018b). *The Sustainable Development Goals Report 2018*. New York: Author.
- United Nations. (2018c). *Water*. Retrieved from <http://www.un.org/en/sections/issues-depth/water/>
- UN CESCR (UN Committee on Economic, Social and Cultural Rights). (2002). General comment No. 15: The right to water (Arts. 11 and 12 of the Covenant), 20 January 2003, E/C.12/2002/11. Retrieved from <https://www.refworld.org/docid/4538838d11.html>
- UN General Assembly. (2013). *Resolution adopted by the General Assembly on 9 July 2013: Format and organizational aspects of the High-Level Political Forum on Sustainable Development (67/290)*. New York: Author.
- UN General Assembly. (2018). *Midterm comprehensive review of the implementation of the international decade for action, “water for sustainable development”, 2018–2028 (A/C.2/73/L.24/Rev.1 C.F.R.)*. New York: Author.
- UN Water. (2012). *UN-Water terms of reference*. Geneva: United Nations.
- UN Water. (2018). *Addressing global water challenges and accelerating progress on SDG 6 at the country level*. Technical Advice Concept Note. Geneva: United Nations.
- UNEP (United Nations Environment Programme). (2012). *The UN-Water status report on the application of integrated approaches to water resources management*. Nairobi: Author.
- UNEP. (2018). *Progress on integrated water resources management. Global baseline for SDG 6 indicator 6.5.1: Degree of IWRM implementation*. Retrieved from <https://www.unwater.org/publications/progress-on-integrated-water-resources-management-651/>
- UNESCO IHP (UNESCO International Hydrological Programme). (2010). *Transboundary aquifers. Challenges and new directions*. Paris. ISARM (International Shared Aquifer Resources Management).

Warner, J. F., Hoogesteger, J., & Hidalgo, J. P. (2017). Old wine in new bottles: The adaptive capacity of the hydraulic mission in Ecuador *Water Alternatives*, 10(2), 322-340.

WBGU (German Advisory Council on Global Change). (2001). *World in transition 2: New structures for global environmental policy*. London: Earthscan.

WCD (World Commission on Dams). (2000). *Dams and development. A new framework for decision-making. The report of the World Commission on Dams*. London: Earthscan.

WIN & WaterLex. (2013). *Corruption and the human right to water and sanitation. Human right-based approach to tackling corruption in the water sector*. Retrieved from https://www.waterlex.org/new/wp-content/uploads/2013/12/2013-WaterLex-WIN_Corruption-and-the-HRWS-.pd

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