

# 6

## **The role of water security in achieving the Sustainable Development Goals: Realising synergies, balancing trade-offs**

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# 1 Introduction

Water is indispensable for producing food, maintaining ecosystems, and ensuring human health and dignity. Good management of water is thus a core element of human development. For many countries, meeting diverse water needs requires reconciling several tensions, including competing demands from agriculture and urban sectors. It also involves ensuring sufficient flows to maintain vital ecosystem functions and achieving resilience to climate change. Achieving water security thus presents multiple challenges for governance. The Sustainable Development Goals (SDGs) offer a much more holistic agenda than the Millennium Development Goals (MDGs) and will thus require more significant governance reforms, both within the water sector itself and in how it interacts with other relevant sectors.

This chapter proposes a simple three-stage model to help countries evaluate the governance reforms needed to make this holistic vision a reality. The logic underlying the model is that water governance arrangements will shift as national priorities move from: 1) improved access to water for basic human needs; to 2) enhanced efficiency; and then to 3) systems transformation. This will not necessarily be a linear process wherein countries transition seamlessly from one stage to the next. Some countries will face multiple challenges at once. Others will have different priorities in different parts of the country. Yet others may leapfrog stages to avoid becoming locked into resource-intensive development patterns. International organisations and research institutions have a pivotal role in helping countries optimise allocations of water to meet multiple and diverse needs. They can also assist national and local governments in tailoring governance reforms to different contexts.

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## 2 The water security crises

At present, many of the world's water systems face an impending crisis. Escalating demands, worsening pollution and extreme climatic events have placed the security of water systems at risk. The seriousness of these threats is highlighted in the 2015 Global Risk Report that identifies a water crisis as one of the few global risks with both a high likelihood and high impact (WEF, 2015). The trends highlighted in Table 6.1 underscore the magnitude of this crisis.

Table 6.1 Signs of global water security crisis

Area	Situation and trends
Water and sanitation	As of 2012, 748 million people lacked access to improved sources of drinking-water, 2.5 billion people did not use improved sanitation, and 1 billion practiced open defecation (WHO & UNICEF, 2014).
Water for food	Approximately, 70% of the water withdrawals from lakes, rivers and underground reserves at global level currently go to irrigation. An additional billion tonnes of cereals and 200 million tonnes of meat will need to be produced annually by 2050 to satisfy growing food demand for projected a population of nine billion. Production of each kilogram of cereal requires 1,500 litres of water and meat production requires 8-10 times more water than cereal.
Water for energy, industry and cities	Approximately 15% of the world's total water withdrawals in 2010 (583 billion m <sup>3</sup> ) were used for energy production. Roughly 70% of industrial water use is for energy production. Global water withdrawals are projected to increase by 55% through 2050 due to growing demands from manufacturing (400%), thermal electricity generation (140%) and domestic use (130%).
Water scarcity	Over 1.4 billion people currently live in river basins where the use of water exceeds minimum recharge levels, leading to the

	desiccation of rivers and depletion of groundwater. By 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity (<500m <sup>3</sup> /capita/year), and two-thirds of the world's population could be living under water-stressed (<1,700 m <sup>3</sup> /capita/year) conditions.
Water-Food-Energy Nexus	Demand for water, food and energy is expected to rise by 30-50% by 2030. Any strategies to deal with this demand by ignoring interconnections risks serious unintended consequences (WEF, 2011).
Water Pollution	Up to 90% of wastewater in developing countries flows untreated into water bodies. Around 80% of Asia's rivers are in poor health, threatening USD 1.75 trillion in ecosystem services per year(ADB & APWF, 2013).
Water-related disasters	The frequency and intensity of water-related hazards is generally rising. By 2050 the number of people vulnerable to flood disaster is expected to increase to 2 billion.
Climate Impacts	Climate change could force an additional 1.8 billion people to live in a water-scarce environment by 2080. Rain-dependent agriculture could be down by 50 percent by 2020 due to climate change impacts.

Source: UN-Water Statistics

(<http://www.unwater.org/statistics> cited on 2015 January 10), unless specified

Climate change represents an increasing and serious risk to development that demands special attention. Many of the impacts of climate change will be felt through increased variations in the water cycle, more frequent floods, or extended droughts on global, regional and local scales. In implementing the SDGs, capacity to predict local and regional climate risks and devise appropriate adaptive measures must be enhanced. Preparations taken to mitigate these risks would help to achieve water security, which would ensure security in multiple other areas, including food, health and energy.

However, the inclusion of a water goal in the SDGs does not guarantee that effective solutions to water security challenges will be implemented. One concern is that the central role of water in achieving poverty reduction, food security, energy access, health and other goals is insufficiently emphasised in the SDGs framework itself. These interlinkages must be considered at national and subnational levels during implementation.

### 3 The crucial role of water in achieving the SDGs

Avoiding the water risks and reaping the multiple development benefits of water security requires better coordination and effective water governance. Water is a shared resource serving multiple, often competing purposes, such as direct public use and health (drinking, sanitation, personal hygiene), food (irrigation, aquaculture, livestock), energy (hydropower, cooling of power plants, bio-fuels production), industrial production, environment (hydrological integrity, ecosystem functions, recreation, assimilation of pollutants), and transport (navigation). The SDGs provide an unprecedented opportunity for dealing with the water security crisis by enhancing coordination across sectors, stakeholders and levels. In order to establish better coordination between water and other sectors/areas, it is important to identify the linkages between the water targets and other SDG goals and targets. Figure 6.1 provides a simple framework for how this can be done.

There are two basic kinds of linkages between water and other goals and targets (see the right hand side of Figure 6.1):

- 1) How efforts to meet water targets can either support or impede the achievement of other SDGs targets;
- 2) How efforts to meet other SDGs targets can either support or impede the achievement of water targets.

The first approach to assessing interlinkages emphasises how improved water management can contribute to other aspects of sustainable development. For instance, access to safe drinking water and sanitation will have positive spill-over effects on goals related to education and gender equality (improved restroom facilities in schools can lead to a lower drop-out rate for girls), health (reduction in waterborne diseases),

and environment (less pollution and reduced risk of eutrophication, if wastewater is managed properly). Similarly, improved water use efficiency in one sector can increase the availability of water for other uses and result in a reduction in the volume of wastewater.

The second approach emphasises how improved governance of other aspects of sustainable development can contribute to water security. For instance, targets on zero hunger or universal access to energy could lead to an expansion of irrigated agriculture or the construction of water-intensive power plants. This could in turn increase the pressure on available water resources. Similarly, improved access to energy can increase water abstraction by providing energy for water pumping. However, such linkages are not well reflected in the SDGs; only the goals on health, cities and settlements, sustainable consumption and production, and ecosystem/environment mention water in their targets. Implementation processes need to consider other relevant linkages as well, since failure to do so could result in unwanted trade-offs.

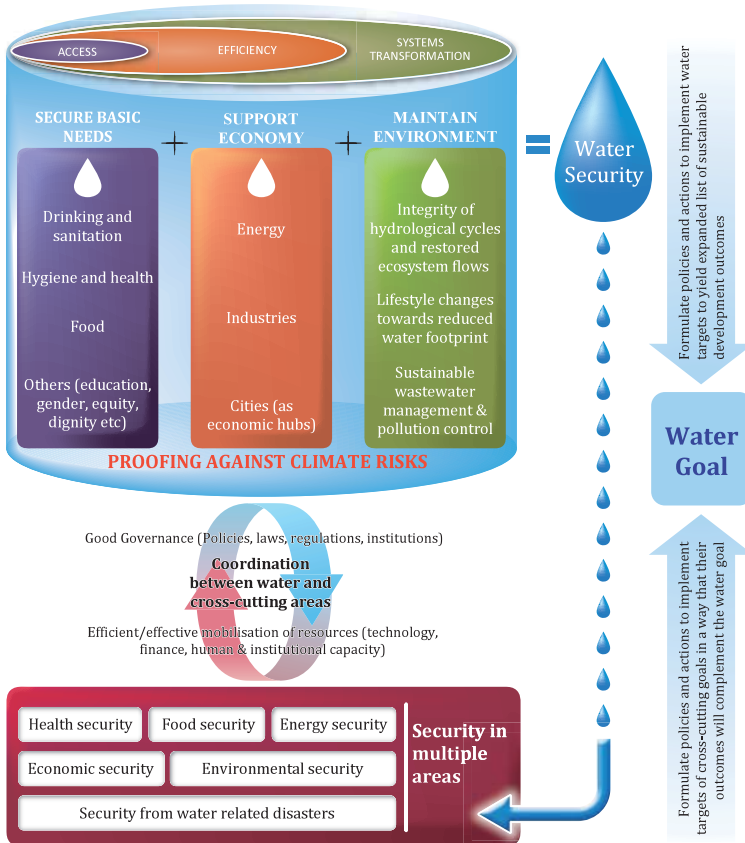


Figure 6.1 Linkages between water security and other aspects of sustainable development Source: Authors

In the processes of planning and implementation, governments will need to view the SDGs through a water lens and seek solutions that create synergies rather than trade-offs. In the area of agriculture and food, for example, drought-resistant crop varieties, drip irrigation, controlling overconsumption, minimisation of food wastage, and adoption of diets with lower water footprint such as choosing plant protein instead of meat or minimised consumption of processed foods are among the options that offer strong water-related synergies.

Some goals and targets can yield strong synergies and serve as means of implementation (MOI) for achieving others. This will help allocate scarce resources effectively and efficiently. Implementation plans for the SDGs should thus be based on assessments of linkages between goals and targets. This is needed for effective implementation of the SDGs in general, but particularly relevant for water. The science and research community could play an important role in clarifying linkages and international organisations can offer support to governments in countries where analytical capacity is insufficient.

However, linkages between water and other development objectives are likely to be complex. Even with scientific input and careful planning, predictions of how actions towards meeting one objective influence efforts to achieve others will be uncertain. This uncertainty suggests a need for adaptive planning with good monitoring of progress and systems for quick feedback and revision. It also necessitates tailoring approaches to different circumstances.

## 4 Tailoring governance arrangements to shifting challenges and needs

The need for effective policy coordination of water issues, both within the water sector and with related domains, is universal. However, the approach needed for operationalising such coordination will vary from one country to the next. Figure 6.2 shows a simplified model of water priorities and corresponding governance arrangements for three groups of countries at different levels of development. It is suggested that as a country moves up the development ladder its water governance systems could gradually shift focus from: 1) improved access to water for basic human needs; to 2) enhanced efficiency; and then to 3) systems transformation.



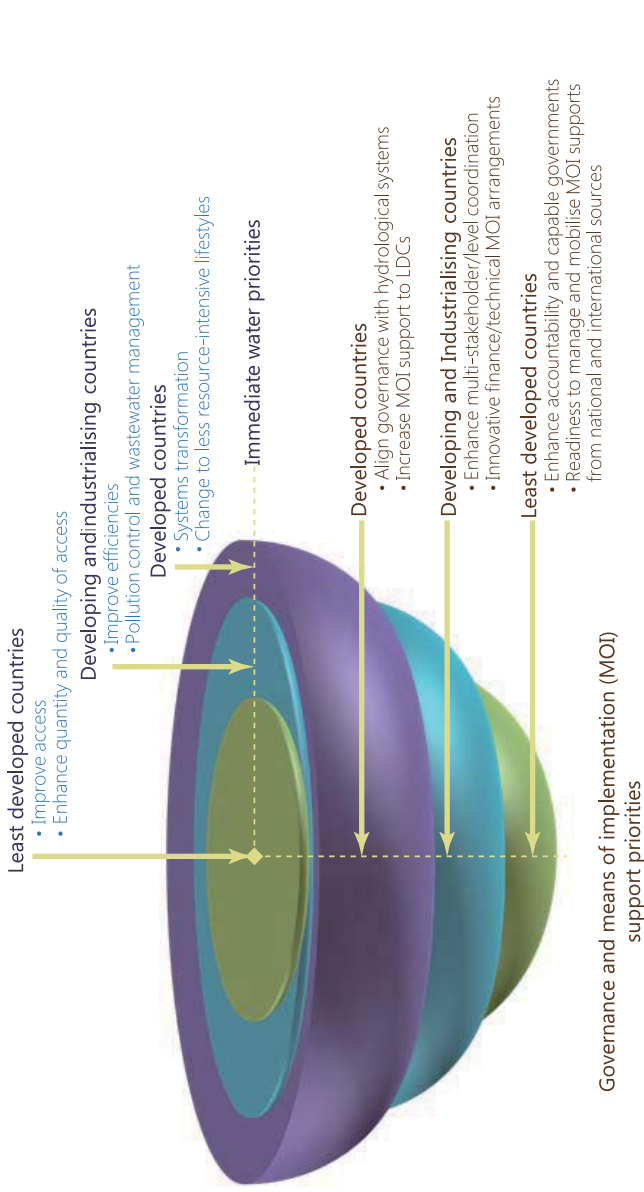


Figure 6.2 An illustration of how countries may interpret targets and MOI for an SDG on water Source: Authors

The first basic challenge is to secure access to water needed for basic human needs. Addressing this challenge is a high priority for most Least Developing Countries (LDCs) and this was the focus of the MDGs. But while the MDGs helped elevate the status of water and sanitation in a general sense and led to significant improvement, the SDGs need to place more emphasis on the quality and sustainability dimensions of water services (UNSGAB, 2014). Such a reframing will help ensure that water policy more effectively promotes health, food security and other essential livelihood needs.

To meet these needs, LDCs will require significant increases in technology access, finance mobilisation (international as well as domestic), and capacity (both human and institutional) to drill wells, build dams and construct purification and distribution systems and manage them effectively. The returns on these investments could be significant: losses from inadequate investment in water and sanitation globally are estimated to be USD 260 billion annually (Hulton & WHO, 2012). However, national and subnational water governance reforms could significantly improve access to international financing. Access to finance depends to a high degree on the quality of governance, not least in the water sector (Grigg, 2008). In the absence of good governance, countries will neither be able to mobilise resources effectively (including private financing) nor put domestic funding to good use. Development partners and international organisations should therefore pay more attention to institutional capacity building for improved water governance as an essential complement to funding. Support for climate adaptation is also of vital importance in this context.

The second basic challenge is enhancing efficiency. This is especially relevant for industrialising and middle-income countries where access for basic needs has generally been achieved but where issues associated with rapidly increasing consumption, worsening pollution and competition over water from multiple sectors are moving up the political agenda. In these countries, improved water efficiency is gradually becoming a necessary complement to efforts to expand supplies. This is in many cases a prerequisite for increased energy generation, urban development, growing industrial production, and rising agricultural output.

The efficiency challenge is usually met through an engineering approach involving technology substitution, such as improved performance of centralised wastewater treatment, and, in certain cases, adoption of water reuse and recycling. But the deployment of more efficient solutions

requires appropriate policies and institutions. Economic incentives such as water pricing are often recommended. However, designing and implementing effective water pricing-policies (and ensuring they do not burden low-income groups) requires sufficient administrative capacity and good governance arrangements. Similarly, growing competition over water resources necessitates legally-defined water rights as well as institutions to protect those rights and help resolve conflicts. Competition over water from different sectors is a particular challenge and the water-energy-food-climate nexus (Hoff, 2011) is a useful framework for analysing such linkages.

Like LDCs, developing and industrialising countries may also need development assistance and technology transfer. But they also need to look increasingly to private capital, public-private partnerships and other innovative funding schemes to boost water efficiencies. A well-designed enabling environment—including economic instruments, incentives for efficient water distribution, and water recycling programmes—will be critical to attracting such resources. Domestic institutional arrangements that support the scaling of sound regulatory practices and technologies promise to be similarly crucial. Perhaps most central is the need for forms of governance that engage multiple stakeholders at multiple levels. More effective forms of multi-level, multi-stakeholder governance will be instrumental to making the most of financial, technological and human resources.

The third challenge is labelled here as systems transformation. Systems transformation implies a holistic approach to providing water-related services while ensuring that the use of water resources remains sustainable at all geographical scales. This should be the priority of advanced countries, although this is not always the case in practice. Systems transformation should also guide developing and industrialising countries, inspiring them to “leapfrog” polluting and resource-intensive stages of conventional development. Systems transformation can be pursued along four mutually supportive tracks:

- Working with natural systems. This can involve forest conservation or reforestation in upstream parts of river basins to reduce the severity of floods, protection of natural wetland areas for water regulation and purification, and land management that facilitates rainwater infiltration and natural recharge of groundwater aquifers.
- Addressing the interlinkages between water systems and nutrients, in

particular nitrogen and phosphorus. This can involve both protecting water bodies from pollution—including from non-point sources, such as runoff from cultivated land—and promoting circulation of nutrients between food consumption, especially in cities, and food production.

- Steering lifestyles and consumption patterns away from water-intensive practices and products. This can involve limiting consumption of water-intensive products, such as meat or processed foods, minimising food wastage, and promoting farming and landscaping that do not require intensive irrigation.
- Making water infrastructure less energy- and resource-intensive. Conventional urban water systems are energy-intensive and generate significant amounts of greenhouse gases (GHGs). Reducing these impacts requires innovative thinking and systems redesign based on ecological principles.

The three basic challenges and the differentiation between country groupings are intentionally indicative and simplified. As has been mentioned, countries need not move in a linear fashion from access to efficiency to systems transformation. In fact, when countries move up the development ladder they should be careful not to adopt outdated unsustainable solutions. Once access for basic needs have been generally achieved, countries should try to leapfrog to more sustainable solutions than are currently common in advanced countries – in line with the systems transformation described above. To help developing countries make such transitions, developed countries can play a catalytic role by transferring good water management experiences and appropriate technologies as well as helping to build capacity and institutions for good water governance. South-South experience sharing and technology transfer should also be given more attention.

In addition, the diversity within countries can be as great as between countries. Different regions, settings (cities, slums, peri-urban, rural) and income groups are often facing quite dissimilar water challenges. This brings a need for governments to deal with different circumstances and priorities simultaneously. Some middle-income countries may be in a situation where they need to address all the three basic challenges outlined above, potentially straining capacity for water governance. The international community has an important role to play to assist countries in dealing with such challenges.

## 5 Towards national implementation

The SDGs framework includes a standalone goal on water and sanitation, with six specific targets and two supporting targets on means of implementation. This raises the visibility of water issues and recognises water security as a key priority for sustainable development. However, the water goal by itself may not prompt governments, donors and other related stakeholders to undertake the reforms needed to avert water crises. Governments should realise that it is in their own national interest to look at water in a more holistic way rather than just seeking to achieve the individual SDG targets as stated. More specifically, they need to ensure that appropriate legal frameworks and institutional arrangements are in place to address the linkages between water and other SDGs and coordinate related actions.

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Financial and other resources are always limited and it may not be possible to allocate sufficient support for each and every target. Some goals and targets will get more attention than others – especially those where there are already established institutions, delivery mechanisms, and constituencies with clear demands. In light of this situation, it will be essential to make sure that available resources are used effectively. Water is one of the areas where the potential synergies with other objectives are particularly high, but maximising such synergies requires carefully conceived cross-sectoral actions, based on good understanding of inter-linkages.

Multiple stakeholders need to be engaged in joint problem-solving. Countries, with national governments taking the lead, are expected to draw up their own SDG implementation plans reflecting their specific circumstances. These national planning processes of setting priorities, establishing nationally appropriate numerical targets, and selecting indicators to guide the implementation will be a critical step for moving the Post-2015 Development Agenda forward. Here, an inclusive multi-stakeholder process is needed to reflect the interests of various

groups and sectors and take advantage of their capabilities. In particular, the areas of agriculture, energy, industrial development, urban planning, environment and health all need to be linked to water planning.

Countries that host transboundary river basins or aquifers can go one step further by setting up joint planning and monitoring mechanisms for these shared water resources. Ideally, common numerical targets and

*Countries need to establish robust monitoring systems that are suited to national circumstances for successful achievement of the goals and targets*

indicators should be agreed for whole transboundary basins or internationally shared aquifers. Without such joint planning, countries might face setbacks in implementing their SDGs water targets domestically.

Achieving the SDG on water and beyond will also require good indicators, robust data and appropriate mechanisms for learning as well as follow-up and review processes. In addition to the international review mechanisms that will be agreed for

the SDGs, countries themselves need to establish robust monitoring systems that are suited to national circumstances. This is not just a prerequisite for accountability but also for effective learning, follow-up, and ultimately successful achievement of the goals and targets. Such systems should also include officially recognised channels for monitoring and reporting by various stakeholders, including the academic community and civil society.

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