6 CLEAN WATER AND SANITATION

2018

PROGRESS ON

INTEGRATED WATER RESOURCES MANAGEMENT

GLOBAL BASELINE FOR SDG 6 INDICATOR 6.5.1:

DEGREE OF IWRM IMPLEMENTATION

UN WATER

UN environment

United Nations Environment Programme

PRESENTING THE UN-WATER INTEGRATED MONITORING INITIATIVE FOR SDG 6

Through the UN-Water Integrated Monitoring Initiative for Sustainable Development Goal (SDG) 6, the United Nations seeks to support countries in monitoring water- and sanitation-related issues within the framework of the 2030 Agenda for Sustainable Development, and in compiling country data to report on global progress towards SDG 6.

The Initiative brings together the United Nations organizations that are formally mandated to compile country data on the SDG 6 global indicators, who organize their work within three complementary initiatives:

- **WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP)**[1]
  Building on its 15 years of experience from Millennium Development Goals (MDG) monitoring, the JMP looks after the drinking water, sanitation and hygiene aspects of SDG 6 (targets 6.1 and 6.2).

- **Integrated Monitoring of Water and Sanitation-Related SDG Targets (GEMI)**[2]
  GEMI was established in 2014 to harmonize and expand existing monitoring efforts focused on water, wastewater and ecosystem resources (targets 6.3 to 6.6).

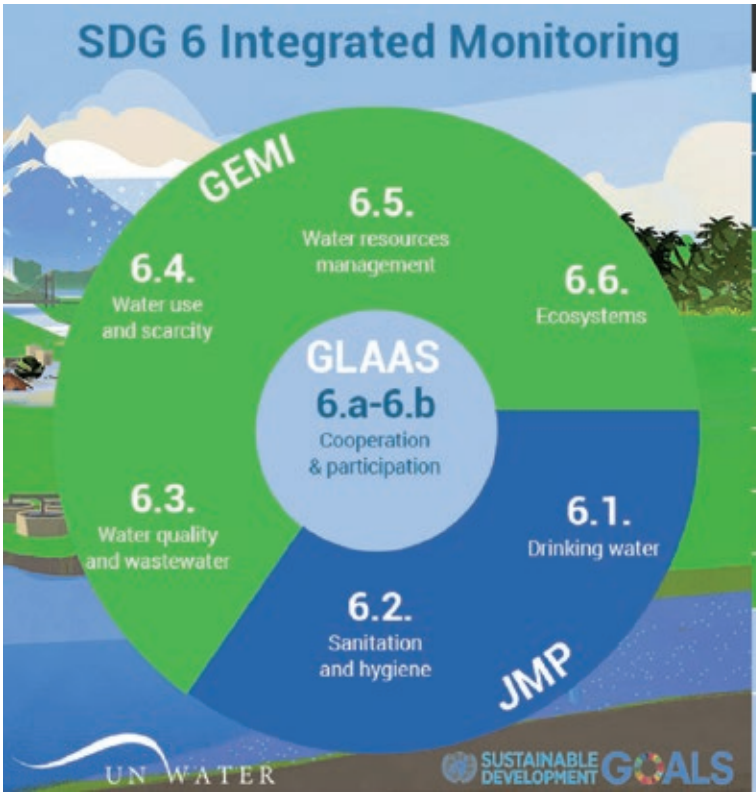
- **UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS)**[3]
  The means of implementing SDG 6 (targets 6.a and 6.b) fall under the remit of GLAAS, which monitors the inputs and the enabling environment required to sustain and develop water and sanitation systems and services.

The objectives of the Integrated Monitoring Initiative are to:

- Develop methodologies and tools to monitor SDG 6 global indicators
- Raise awareness at the national and global levels about SDG 6 monitoring
- Enhance technical and institutional country capacity for monitoring
- Compile country data and report on global progress towards SDG 6

The joint effort around SDG 6 is especially important in terms of the institutional aspects of monitoring, including the integration of data collection and analysis across sectors, regions and administrative levels.

To learn more about water and sanitation in the 2030 Agenda for Sustainable Development, and the Integrated Monitoring Initiative for SDG 6, visit our website: www.sdg6monitoring.org



INDICATORS	CUSTODIANS
6.1.1 Proportion of population using safely managed drinking water services	WHO, UNICEF
6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	WHO, UNICEF
6.3.1 Proportion of wastewater safely treated	WHO, UN-Habitat, UNSD
6.3.2 Proportion of bodies of water with good ambient water quality	UN Environment
6.4.1 Change in water-use efficiency over time	FAO
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	FAO
6.5.1 Degree of integrated water resources management implementation (0-100)	UN Environment
6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	UNESCO, UNECE
6.6.1 Change in the extent of water-related ecosystems over time	UN Environment, Ramsar
6.a.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan	WHO, UN Environment, OECD
6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	WHO, UN Environment, OECD

[1] http://www.sdg6monitoring.org/about/components/jmp/

[2] http://www.sdg6monitoring.org/about/components/presenting-gemi/

[3] http://www.sdg6monitoring.org/about/components/glaas/

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UN Environment-DHI Centre on Water and Environment

Global Water Partnership

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The identification of national focal points and subsequent training and support were facilitated by UN Environment, UN Environment-DHI Centre, Cap-Net, the Global Water Partnership, and UN-Water.

Data analysis and development of this report were carried out by a working group with the following members: Paul Glennie (coordinating lead author), Maija Bertule (head of country support and lead data analyst), Paul Taylor (lead free-text analyst), Peter Koefoed Bjørnsen, Gareth James Lloyd and Nisha Gill Hansted, all from the UN Environment – DHI Centre on Water and Environment; and Alexander Egholm Møller, Nisha Midha and Lilian Neuer as interns with UN Environment – DHI Centre; and (the following in alphabetical order of affiliation) Josh Newton from the Global Water Partnership (GWP), James Dalton from the International Union for the Conservation of Nature (IUCN), Håkan Tropp and Oriana Romano from the Organisation for Economic Co-operation and Development (OECD), Marianne Kjellen from the UN Development Programme (UNDP), Alistair Rieu-Clarke from the UN Economic Commission for Europe (UNECE), Joakim Harlin from UN Environment, and Marina Takane from the World Health Organisation (WHO / GLAAS).

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FOREWORD

SDG 6 INDICATOR REPORT SERIES

Water is the lifeblood of ecosystems, vital to human health and well-being and a precondition for economic prosperity. That is why it is at the very core of the 2030 Agenda for Sustainable Development. Sustainable Development Goal 6 (SDG 6), the availability and sustainable management of water and sanitation for all, has strong links to all of the other Goals.

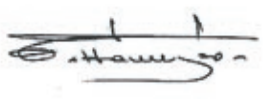
In this series of progress reports under the UN-Water Integrated Monitoring Initiative for SDG 6, we evaluate progress towards this vital goal. The United Nations agencies are working together to help countries monitor water and sanitation across sectors and compile data so that we can report on global progress.

SDG 6 expands the Millennium Development Goal focus on drinking water and basic sanitation to include the management of water and wastewater and ecosystems, across boundaries of all kinds. Bringing these aspects together is an essential first step towards breaking-down sector fragmentation and enabling coherent and sustainable management, and hence towards a future where water use is sustainable.

This report is part of a series that track progress towards the various targets set out in SDG 6 using the SDG global indicators. The reports are based on country data, compiled and verified by the United Nations agencies responsible, sometimes complemented by data from other sources. The main beneficiaries of better data are countries. The 2030 Agenda specifies that global follow-up and review "will be primarily based on national official data sources", so we sorely need stronger national statistical systems. That will involve developing technical and institutional capacity and infrastructure for more effective monitoring.

To review overall progress towards SDG 6 and identify interlinkages and ways to accelerate progress, UN-Water produced the SDG 6 Synthesis Report 2018 on Water and Sanitation. It concluded that the world is not on track to achieve SDG 6 by 2030. This finding was discussed by Member States during the High-level Political Forum on Sustainable Development (HLPF) in July 2018. Delegates sounded the alarm about declining official development aid to the water sector and stressed the need for finance, high-level political support and leadership and enhanced collaboration within and across countries if SDG 6 and its targets are to be achieved.

To achieve SDG 6 we need to monitor and report progress. That will help decision-makers identifying and prioritize where, when, how and at what interventions are needed to improve implementation. Information on progress is also essential to ensure accountability and generate political, public and private sector support for investment. The UN-Water Integrated Monitoring Initiative for SDG 6 is an essential element of the United Nations' determination to ensure the availability and sustainable management of water and sanitation for all by 2030.



Gilbert F. Houngbo,
UN-Water Chair and President
of the International Fund for
Agricultural Development

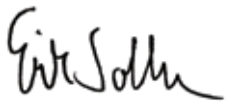
INDICATOR 6.5.1 IMPLEMENTATION OF INTEGRATED WATER RESOURCES MANAGEMENT

For villages near the Lingmutey-chu stream in Bhutan, water scarcity and food shortages used to be common. Conflicts between farmers located upstream and downstream were also frequent. But when the community led the conceptualization and adoption of a water resource management strategy that involved everyone concerned, the results were inspiring. Water supply for irrigation and food security improved, and agricultural productivity of farmers increased.

UN Environment is proud to support a series of reports that assess the world's progress on Sustainable Development Goal number 6, which aims to ensure availability and sustainable management of water and sanitation for all. In this Report, we report on the efforts of 172 countries to put in place integrated water resources management such as successfully demonstrated in Bhutan.

Taking such an integrated approach to water resources management can have multiple benefits including sustainable and efficient agriculture, economic stability, ecosystem protection, and peace and security. However 60 percent of countries are unlikely to achieve this important target at all levels, including transboundary cooperation, unless we significantly accelerate progress.

The Report illustrates examples from countries highlighting key challenges, and importantly examples of success that are highly relevant for other countries in the world. It also aims to support countries and stakeholders in prioritizing action to advance sustainable water management in each country.



Erik Solheim,
UN Environment Executive Director and Under-Secretary-General of the United Nations

EXECUTIVE SUMMARY

Decisions about how to allocate and use water are fundamental to sustainable development. Such measures underlie all essential aspects of the human endeavour: human health and well-being, agriculture, business, and the quality of life in rural and urban areas. At the same time, water scarcity is becoming more commonplace. Pollution is increasing. Natural ecosystems are under growing pressure. Thus, the matter of determining how to allocate and use water in an efficient, sustainable and equitable manner is foundational.

It is also complex. Successful managing of water resources is a long-term and unceasing process. It requires the input and interaction of governments, agencies and organizations at international, national, regional and local levels, the private sector, charitable enterprises and dedicated individuals. Recognizing this, nations agreed to adopt integrated approaches to water resources management (IWRM) at the 1992 Earth Summit. The passing years have only underscored the importance of pursuing and implementing these measures to achieve the United Nations 2030 Agenda for Sustainable Development. Integrated water resources management provides an essential framework to achieve not only SDG 6 – to "ensure availability and sustainable management of water and sanitation for all" – but also to achieve all Sustainable Development Goals (SDGs).

With but a dozen years remaining until the target year, understanding the progress that has been made – and the tasks that remain – is urgent. This report aims to examine these issues in detail. It represents the work of 172 countries that provided information on efforts to implement integrated water resource management. Their assessments of successes and challenges are the core of this report. Through quantitative data and qualitative discussion, the report presents a global picture of the current state of affairs on water management. Though the report covers the subject in detail, **its central message can be distilled into two words: ACCELERATE PROGRESS.**

The very participation of the vast majority of the relevant world community in the assessments that underpin this report suggests a recognition of the importance of the task, a desire to achieve aims, and a willingness to move forward apace. The task is great: to come up with a network of policies and laws that create an enabling environment; to coordinate diverse players with different and often competing interests; to generate data to make effective decisions; and to find the financial wherewithal to transform plans into realities. The findings of this report demonstrate that the world's nations can learn from one another, and that the insights they have gained thus far can chart the way forward. As the report underscores, nations of the world should act now – with urgency and speed.

KEY MESSAGES

The vast majority, 80 per cent, of countries have laid the foundations for integrated water resources management. Implementation must now be the focus.

- At the lower end, 20 per cent of countries have started developing IWRM approaches. They need to prioritize activities that will have the greatest impact in the national context.
- In the mid-range, 40 per cent of countries have institutionalized most IWRM elements. They need to focus on implementation.
- Another 20 per cent of countries are generally implementing most elements of IWRM in long-term programmes. They need to expand coverage and stakeholder engagement.
- The top 20 per cent of countries are generally achieving their policy objectives for integrated water resources management. They need to remain focused to consolidate and strengthen gains.

IWRM implementation needs to accelerate to realize the 2030 Agenda.

Integrated approaches help to coordinate sustainable development and water management for the full spectrum of users: residents in urban and rural areas, agriculture, industries and natural ecosystems. This coordination is critical for the full 2030 Agenda. With water scarcity and pollution increasing, finding ways to address conflicts and trade-offs is critical to allocate and use water in an efficient, sustainable and equitable manner.

Collective action that builds on the multi-stakeholder monitoring and reporting processes can accelerate implementation.

Multi-stakeholder processes for completing the survey that forms the basis of this report identify challenge areas and actions in line with national priorities and planning processes across sectors. Moving forward, all countries can build on these experiences. They can make full use of the integrated, multi-stakeholder approach to advance progress and set national targets where appropriate.

MEASURING PROGRESS

The survey conducted for this report assesses progress towards SDG target 6.5: "by 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate" as measured by two complementary indicators:

- **6.5.1** Degree of integrated water resources management implementation (0-100)
- **6.5.2** Proportion of transboundary basin area with an operational arrangement for water cooperation (which uses a different survey and is reported on separately)

The report summarizes results from the 172 countries that completed the self-assessed questionnaire containing 33 questions covering the main elements of integrated water resources management at national and basin levels, organized in four sections:

- **Enabling environment** of policies, laws, plans and arrangements.
- **Institutional frameworks**, cross-sectoral coordination, private-sector and other stakeholder participation and gender objectives.
- **Management instruments** and programmes for informed decision making, covering water availability monitoring and sustainable water use, pollution control, water-related ecosystems and disasters, and data and information sharing.
- **Financing** for investments, including infrastructure, recurring costs and revenue raising.

Following the SDG 6.5.1 indicator methodology, individual question scores were averaged within and across sections to obtain overall scores representing implementation of integrated water resources management. The scores are grouped into six implementation categories, ranging from very low to very high.

IMPLEMENTING IWRM AT ALL LEVELS

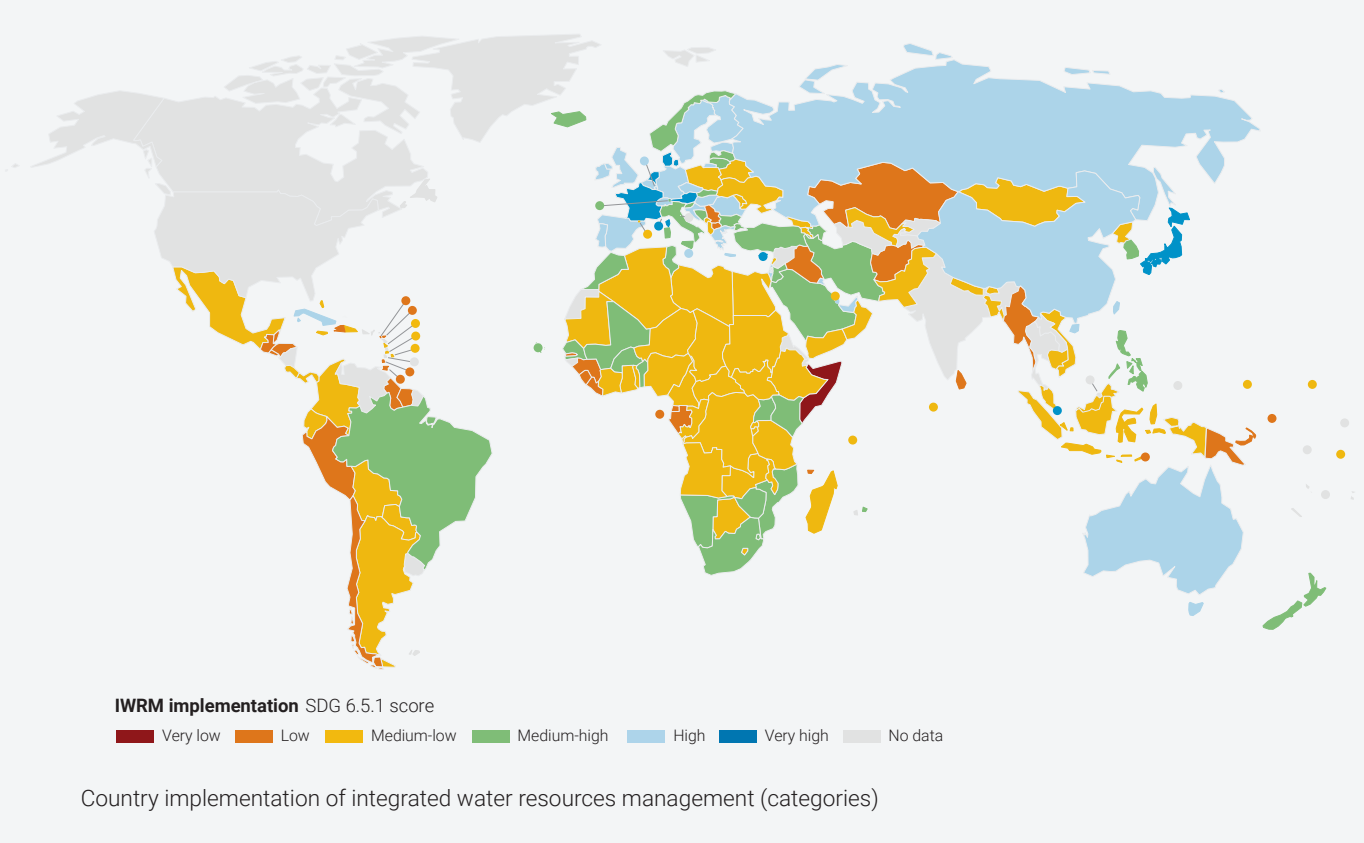
Countries are implementing IWRM, but implementation status varies enormously. Implementation is taking place at all levels (national subnational, basin, aquifer, local and transboundary) but to such a degree that implementation scores span the full range from zero to 100. In many countries, multi-sector national and basin/aquifer authorities and community water user associations and boards demonstrate an integrated approach to the development and implementation of policy, laws and planning for water resources management.

ASSESSING CURRENT STATUS AND EXPECTED PROGRESS TOWARDS 2030

More than 80 per cent of countries have laid solid foundations to achieve at least medium-low levels of IWRM implementation. Progress now needs to accelerate.

Percent of countries at each implementation level		Score range	Baseline	Towards 2030
4	Very high	91-100	Achieving policy objectives for IWRM: 19 per cent	Countries in this category are likely to reach the global target, or have already done so, but will need to remain focused to consolidate and strengthen gains.
15	High	71-90		
21	Medium-high	51-70	Implementing most elements of IWRM in long-term programmes: 21 per cent	Countries in this category are potentially able to reach the target, but sustained efforts need to focus on 2030 targets.
41	Medium-low	31-50	Have institutionalized most elements of IWRM: 41 per cent	**Countries in these three lowest categories (60 per cent of countries) are unlikely to meet the global target unless progress significantly accelerates.**
19	Low	11-30	Have started developing elements of IWRM: 19 per cent	**Countries in the three lowest categories should aim to set national targets based on the country context.**
<1	Very low	0-10		

The global target is to reach "very high" implementation levels. Countries may need to set context-specific national targets to drive implementation towards 2030.



Country implementation of integrated water resources management (categories)

Subnational, basin, aquifer and local levels tend to lag national-level implementation. Capacity and resources are often lacking at the basin and aquifer levels for institutions and planning, management instruments and revenue raising.

Coordination among levels is important. Integration among all levels is key to ensuring that resources flow to where they are most needed, and where they can be most effective.

Most countries report that arrangements and organizational frameworks are in place for cooperation in most of their significant transboundary basins and aquifers. However, significant differences in capacity and development priorities between countries sharing transboundary basins and aquifers may hamper cooperation. Reporting on SDG indicator 6.5.2 addresses this issue in more detail.

ACHIEVING WIDER IMPLEMENTATION ACROSS SECTORS

Adopt integrated approaches to water supply and wastewater treatment measures. Water resources management encompasses water supply for different sectors (such as agriculture, industry, energy and municipalities), and sanitation, wastewater treatment and water-related disaster-risk reduction. Nevertheless, IWRM is often erroneously perceived as a separate concept to be implemented alongside such activities. Countries should continue implementing these activities. However, implementation should proceed in an integrated manner that considers sector impacts on other water uses and the environment. This is key for achieving more sustainable, equitable and efficient use of water resources, as well as for providing opportunities for joint investments and benefits.

Identify opportunities to integrate water into sectoral programmes and planning processes. There is a need to identify where water resources are being managed within national programmes and planning processes across all sectors that use or pollute water resources – such as those related to agriculture, urban areas, energy generation, and

consumption and production. There is also a need to ensure that water is being managed in a way that considers impacts across sectors, including the environment, and assures long-term sustainability. The SDGs provide a useful framework for coordinated action.

Find and adopt innovative, blended and multi-sector financing approaches to achieve sustainable water resources management for the 2030 Agenda. Some progress has been made in setting up institutions, the enabling environment, and management instruments for water resources management in many countries. Nevertheless, their potential to create positive impacts for societies and ecosystems will not be realized unless investments are secured, allocated and mobilized to ensure water is managed in a sustainable, efficient, and equitable way.

ACCELERATING PROGRESS

Integrated water resources management is an ongoing process with incremental impacts. Any steps a country can take to advance implementation will likely enhance sustainable and equitable management and use of water for all, leading to impacts such as improved allocation, water use efficiency, pollution control, enforcement of regulations and cost recovery. This kind of management is an ongoing process, and, as such, even countries that have "reached" the global target should perpetually review, revise and improve on the various elements of integrated water resources management.

Each country can identify pathways to make progress. There is no "one-size-fits-all" approach to implementing integrated water resources management. In the process of completing the 6.5.1 survey, countries have identified areas requiring action to advance sustainable management of water resources. For countries in which governmental and non-governmental stakeholders across sectors and levels of governance worked together on the survey to reach consensus, this collaboration can be developed to jointly identify actions in line with national priorities. These are significant outcomes of the SDG monitoring process.

For many countries, significant ground can be made by focusing on some of the weaker scores from the monitoring, such as improving basin and aquifer management, gender objectives, financial arrangements and capacity development. Section 6.3 of the full report includes a collection of proposed actions from several countries to provide a sense of how they will further implementation of IWRM towards 2030. While country-specific, these proposals will resonate with many other countries. These actions include very practical operational measures (increase monitoring stations, improve enforcement mechanisms), as well as more challenging ones (increase cost recovery for water-related services). They send a clear message that countries know what they want to achieve and the steps they must take to progress.

Integrated water resources management balances the competing demands and impacts of all users to achieve sustainable development.
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WATER MANAGEMENT AND THE 2030 AGENDA

1

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In today's interconnected world, there is no doubt about the value of integrated planning for sustainable development, though it takes time and effort to achieve. Integrated water resources management supports the economic, social and environmental dimensions of sustainable development.

The need to integrate different aspects of water management across uses and sectors is not new. Member States of the United Nations have been calling for integrated approaches to water resources management for over 40 years (Box 1).[1] Countries reported on progress on the implementation of integrated approaches in 2008[2] and 2012.[3] Building on this, countries are now reporting on Sustainable Development Goal indicator 6.5.1 on implementing integrated water resources management. This report establishes the first global baseline estimates for SDG indicator 6.5.1.

Progress has been made, but more needs to be done. Reporting on the status of water resources management supports its implementation at national and global levels. At the national level, multi-stakeholder processes bring actors from different sectors together, reaching agreement on the status of implementation and identifying gaps in progress. At the global level, reporting facilitates cross-country learning and coordinated activities.

BOX 1

WATER RESOURCES MANAGEMENT SUPPORTS MULTIPLE GOALS.

Integrated water resources management (IWRM) is a process which promotes the coordinated development and management of water, land and related resources to maximize the resultant economic and social welfare in an equitable and sustainable manner. Its implementation supports all Goals across the 2030 Agenda.

1.1 THE 2030 VISION FOR WATER

In 2015, the Member States of the United Nations unanimously adopted the 2030 Agenda for Sustainable Development. The 2030 Agenda comprises 17 Sustainable Development Goals and 169 targets addressing social, economic and environmental aspects of development, and seeks to end poverty, protect the planet and ensure prosperity for all. The SDGs include aspirational global targets that are intended to be universally relevant and applicable to all countries.

Goal 6 is to "Ensure availability and sustainable management of water and sanitation for all", and it includes targets addressing all aspects of the freshwater cycle (Box 2). In relation to water, the SDGs build on the Millennium Development Goals (MDGs), which focus primarily on water supply and sanitation, to consider a more holistic approach to water management.

BOX 2

GOAL 6. ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL.

6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.
6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.
6.b Support and strengthen the participation of local communities in improving water and sanitation management.

[1] 1977 United Nations Water Conference, Mar del Plata; 1992 Earth Summit, Rio de Janeiro; 1992 Dublin Principles; 2002 Johannesburg Declaration on Sustainable Development.

[2] UN-Water (2008). Status Report on IWRM and Water Efficiency Plans for CSD16.

[3] United Nations Environment Programme (UNEP) (2012). The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management.

The targets agreed upon by Member States focus on improving the standard of water supply, sanitation and hygiene services (6.1 and 6.2); increasing treatment, recycling and reuse of wastewater (6.3); improving efficiency and ensuring sustainable withdrawals (6.4); and protecting water-related ecosystems (6.6), all as part of an integrated approach to water resources management (6.5). They also address the means of implementation for achieving these development outcomes (6a and 6b). See inside front and back covers for further information on other SDG 6 targets and indicators, and the roles and responsibilities of custodian agencies and programmes.

Direct and indirect interdependencies connect Goal 6 targets, all of the 17 Sustainable Development Goals, and more than one-third of the 169 targets (see Chapter 5).[4] Integrated approaches to water resources management (target 6.5), can help to harness synergies, and to address potential trade-offs, with and between Goals on, for example: sustainable agriculture and food security (2), health and well-being (3), gender equality (5), energy (7), decent work and economic growth (8), industry, innovation and infrastructure (9), reduced inequalities (10), sustainable cities and communities (11), responsible consumption and production (12), climate action (13), life below water (14), life on land (15), and peace, justice and strong institutions (16).

Two indicators measure progress towards target 6.5 ("implement integrated water resources management at all levels, including through transboundary cooperation as appropriate"):

- **6.5.1** Integrated water resources management implementation (0-100) (see Chapter 2)
- **6.5.2** Proportion of transboundary basin area with an operational arrangement for water cooperation

The two indicators support each other by addressing the two main aspects of the target. Indicator 6.5.2 has a separate indicator report, though linkages are explored in both this report (Section 3.2.2), and in the 6.5.2 indicator report.[5]

Indicator 6.5.1 links to all Goal 6 indicators, such as those on water use efficiency, water supply, sanitation, wastewater treatment, ambient water quality and freshwater ecosystems. As more of a process-based indicator, it also closely links to the "means of implementation" indicators 6.a.1 (water and sanitation-related official development assistance) and 6.b.1 (procedures for local community participation).

1.2 IWRM FOR SUSTAINABLE MANAGEMENT OF WATER RESOURCES

SDG 6 aims to "ensure availability and sustainable management of water and sanitation for all". Achieving Goal 6 will require adaptive water governance to address the intertwined aspirations of the SDGs, and to accelerate current progress.

IWRM provides a holistic framework for addressing different demands and pressures on water resources, across sectors and at different scales. At its core, IWRM provides a framework to ensure that water resources are developed, managed and used in equitable, sustainable and efficient manner. It generally consists of:

- An enabling environment of policies laws and plans
- Institutional arrangements for cross-sectoral and multilevel coordination, and stakeholder involvement
- Management instruments such as data collection and assessments and instruments for water allocation that facilitate better decisions
- Financing for water infrastructure and ongoing costs of water resources management.

Though the concept of IWRM is relatively simple, implementation has proved challenging, and countries have reported mixed results. With the adoption of the SDGs and recognition of the potential for IWRM to mobilize synergies among goals, and to manage trade-offs in targets, the demands on IWRM are now much larger than they were in the past. **IWRM in the 2030 Agenda must deliver more tangible progress and must do so more quickly and at larger scale than previously achieved**. To achieve SDG 6, there is a need for increased focus on the mechanisms for implementing and operationalising IWRM, including sustainable financing, and pragmatic problem solving.[6]

IWRM has sometimes been seen as an end in itself, and as following a one-size-fits-all approach.[7] In truth, IWRM is an extensive, ongoing process that can and must be tailored to individual situations. Furthermore, the various elements of IWRM can be applied in a range of ways by a range of actors, and at different speeds. Implementing these elements of IWRM should consider the local political, economic and social realities in each country. While the IWRM approach can provide the overarching framework, numerous other approaches

[4] UN-Water (2016). Water and Sanitation Interlinkages across the 2030 Agenda for Sustainable Development. Geneva.

[5] United Nations Economic Commission for Europe (ECE) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2018). Progress on Transboundary Water Cooperation – Global baseline for SDG 6 indicator 6.5.2.

[6] Smith, M. and Clausen, T.J. (2018). Revitalising IWRM for the 2030 Agenda: World Water Council Challenge Paper for the High-Level Panel on IWRM at the Eighth World Water Forum. Brasilia.

[7] Shah, T. (2016). Increasing water security: the key to implementing the Sustainable Development Goals. Global Water Partnership, TEC Background Paper nr. 22.

and mechanisms can support the implementation of IWRM. They are therefore complementary, rather than in conflict, and should be seen as catalysts for achieving IWRM objectives. For example (see Chapter 5 for more information):

- Programmes and plans related to sustainable agriculture and food security, sustainable cities and developments, and disaster risk reduction
- The nexus approach, which can provide an excellent mechanism for facilitating dialogue between relevant sectors (e.g. food, energy, water, ecosystems) in a given context
- Source to sea / ridge to reef approaches, which are useful for considering upstream-downstream implications, and land management impacts on the marine environment.
- Ecosystems approach / nature-based solutions
- Corporate water stewardship
- Implementation of water supply, sanitation, wastewater treatment and reuse services
- Integrated flood and/or drought management activities.

In addition to these mechanisms, other governance approaches and measures complement the IWRM framework. These include the 12 OECD Water Governance Principles, which cover the effectiveness, efficiency, and trust and engagement in water governance.[8]

In summary, implementing IWRM should not be seen solely as the task of a water ministry, though it will have a coordinating role to play. While there are no perfect indicators of water governance, an indicator that addresses different elements of IWRM provides a useful feedback mechanism to facilitate the implementation of the core aspects of good water management.

1.3 REPORT OVERVIEW

This baseline report aims to assess the status of IWRM implementation. It includes country examples, an estimate of progress towards the target, and some guidance to countries and the international community to accelerate implementation.

- Chapter 2 describes the indicator methodology, including country data-collection processes and calculation of the indicator.
- Chapter 3 provides the global and regional baseline overview for SDG 6.5.1, as well as an estimate of progress towards the target.
- Chapter 4 provides more detail on the four IWRM dimensions. It includes questions from the survey, and examples of barriers, enablers, and good practices provided from participating countries.
- Chapter 5 describes how water management can be implemented across sectors to support the 2030 Agenda.
- Chapter 6 provides some practical guidance for countries and the international community on implementation of IWRM.

Throughout the report, boxes highlight country experiences with, and examples of, different aspects of IWRM implementation. Boxes contain content developed from the free text responses to the questionnaires, and findings from country workshops. This material provides a snapshot only. (It was not possible to name all potentially relevant countries in given boxes. Further information can be found by downloading the full country responses from the IWRM data portal (Box 3).)

BOX 3

ONLINE RESOURCES ARE AVAILABLE.

The monitoring methodology and all results and supporting documentation are available through the IWRM Data Portal at http://iwrmdataportal.unepdhi.org.

[8] Organisation for Economic Co-operation and Development (2015). OECD Principles on Water Governance.

MONITORING INTEGRATED WATER RESOURCES MANAGEMENT IN THE SDGS

2

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This chapter describes the monitoring methodology for SDG indicator 6.5.1 on implementing integrated water resources management. It includes an overview of the 6.5.1 survey and information about how the indicator value is calculated (Section 2.1); an explanation of how the objectivity, transparency and comparability of the survey results are addressed (Section 2.2); and information about the data-collection process (Section 2.3). Annex E provides information on the development of the indicator methodology, and how it compares to similar methodologies used to report on the status of the application of integrated approaches to water resources management in 2008 and 2012. (Chapters 3 – 6 present results from the monitoring and reporting of SDG indicator 6.5.1.)

2.1 OVERVIEW OF SURVEY ON IWRM IMPLEMENTATION AND INDICATOR CALCULATION

The survey

SDG indicator 6. 5.1 on IWRM implementation is measured on a scale of zero to 100, based on the degree of implementation using 33 questions in a self-assessed country questionnaire, organized into four main dimensions of IWRM:

1. **Enabling environment:** The conditions that help to support the implementation of IWRM, which includes the most typical policy, legal and strategic planning tools
2. **Institutions and participation:** The range and roles of political, social, economic and administrative institutions and other stakeholder groups that help to support implementation
3. **Management instruments:** The tools and activities that enable decision makers and users to make rational and informed choices between alternative actions
4. **Financing:** The budgeting and financing made available and used for water resources development and management from various sources

Each of these four sections contain questions at national, subnational, basin/aquifer, local and transboundary levels (see Table 1). This addresses the target 6.5 formulation of implementing IWRM "at all levels".

The five questions on transboundary implementation of elements of water resources management provide information that complements SDG indicator 6.5.2. All survey questions are provided in Annex A, and the full survey is available online.[9]

Table 1 Overview of the 33 question subjects in the survey, organized in four sections (columns), at all levels (rows)

	1. Enabling Environment	2. Institutions and Participation	3. Management Instruments	4. Financing
National level	• Policy • Law • Plans	• Authorities • Cross-sectoral coordination • Capacity • Public participation • Business participation • Gender objectives	• Availability monitoring • Water-use management • Pollution control • Ecosystem management • Disaster management	• Budget for investment • Budget for recurring costs
Subnational	Policy	Gender objectives	Data and information sharing	• Subnational or basin budget for investment • Revenues raised
Basin / aquifer / local	Basin/aquifer management plans	• Basin/aquifer organizations • Local public participation	• Basin management instruments • Aquifer management instruments	
Trans-boundary	Management arrangements	• Organizational arrangements • Gender objectives	Data and information sharing	Financing for cooperation
Federal countries only	Provincial water law	Provincial authorities	-	-

[9] UN Environment-DHI – Centre on Water and Environment. http://iwrmdataportal.unepdhi.org. Accessed 26 July 2018.

Calculating the indicator score

Each survey question is scored on a scale of zero to 100, in increments of 10, guided by specific threshold descriptions (see Section 2.2). Question scores in each section are averaged to give a section average for each of the four sections, rounded to the nearest whole number. The four section averages are then averaged to calculate the final indicator 6.5.1 score for each country, on a scale of zero to 100.

National benefits of completing the questionnaire

While a single indicator score is calculated for the purposes of tracking progress on target 6.5 at the global level, the scores and free text for each question are more important at the country level. This is because the scores provide a diagnostic tool for identifying key elements of integrated water resources management where implementation can be advanced in line with national priorities. Furthermore, the process of bringing together multiple stakeholders to reach consensus on responses to the survey can provide a valuable mechanism for intersectoral coordination and collaboration. Both aspects are touched on in Section 2.3 and Chapter 6.

2.2 ADDRESSING OBJECTIVITY, TRANSPARENCY, AND COMPARABILITY OF SURVEY RESPONSES

The objectivity, transparency and comparability of the survey responses are addressed in three main ways:

1. Countries have been encouraged to organize multi-stakeholder processes to reach consensus on responses to each question (see Section 2.3). These processes serve the dual purposes of establishing cross-sectoral and multi-level dialogue (Chapter 5), and of ensuring that most key stakeholders in the country agree on the responses, resulting in a more realistic assessment of implementation. While there is no way to systematically and accurately cross-check country reports, these multi-stakeholder processes are the best way of achieving more robust results. Countries reported that it was easier to reach consensus on the scores when they could be based on evidence.

2. For each question, specific guidance is provided for the degree of implementation for the following six thresholds: zero, 20, 40, 60, 80 and 100.

   An example of the threshold descriptions is provided below for the question on the status of the national-level water resources policy, or similar (q.1.1a):

Degree of implementation (0 – 100)	
Very high (100)	Objectives consistently achieved, and **periodically reviewed and revised**.
High (80)	Policy **objectives consistently achieved.**
Medium-high (60)	**Being used by the majority** of relevant authorities to guide work.
Medium-low (40)	**Based on IWRM, approved** by government and **starting to be used** by authorities to guide work.
Low (20)	Exists, but **not based on IWRM**.
Very low (0)	Development **not started** or not progressing.

3. For each question, countries were encouraged to provide justification or reasoning for their score. This may include information on specific challenges facing the implementation, but also a description of the various measures taken to further IWRM. These notes provide a valuable source of information on implementation at the national level. They are used throughout this report to illustrate the specific steps that countries are taking to transform IWRM into practice, and the shapes that IWRM implementation can take in various countries. These justification fields facilitate consensus, facilitate the assessment of progress over time, enhance transparency, and provide national context.

In addition, efforts have been made to ensure a high level of data quality. Measures include holding online training seminars for national focal points, and implementing of quality control processes for submitted questionnaires (annexes F and G).

Despite the measures outlined above, it is acknowledged that country responses retain an element of subjectivity, particularly where multi-stakeholder processes were less extensive. Ultimately, while results are indicative and country-driven, the self-assessed country reporting is designed to be useful to the countries themselves in furthering IWRM implementation. Therefore, the most important issue pertains to what countries do with the information, and how IWRM implementation advances over time, rather than the comparison of scores between countries. At the national level, the surveys can be used as a relatively simple diagnostic tool to identify areas of relatively low or high IWRM implementation. Globally, while it is acknowledged that some deviation (or subjectivity) in individual data points (country scores) may exist, a useful pattern still emerges from 172 data points on the global status of IWRM implementation.

While refinements may be made to further reduce subjectivity in future iterations of the survey, it is believed that this baseline methodology provides a realistic picture of the global

implementation of integrated water resources management, that comparisons can be made between countries, and progress can be measured over time.

Indicator 6.5.1 has been classified as a Tier 1 indicator by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs), meaning that the "indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 per cent of countries and of the population in every region where the indicator is relevant."[10]

2.3 NATIONAL AND GLOBAL DATA-COLLECTION PROCESSES

National data-collection processes

The data-collection process aimed to build on existing monitoring efforts in countries, and to encourage country-led processes for national data collection to the extent possible. Each UN member state was invited to appoint a national focal point (FP) for indicator 6.5.1, responsible for coordinating data collection and submission to UN Environment, serving as the UN Custodian Agency for indicator 6.5.1. About 75 per cent of the focal points are affiliated with national ministries responsible for water management (e.g. ministry of water, ministry of environment, or similar) (see Annex G for full breakdown).

Global data-collection status and support

Focal points were advised to design a process that included multiple stakeholder groups to the extent possible, ensuring that the survey responses represent a consensus amongst stakeholders. In most cases the survey response information has been collected from government officials and various sectoral stakeholders via means of direct communication or workshops.

In 36 countries, stakeholder workshops were held in collaboration with the Global Water Partnership (GWP), together with the national focal points and GWP country water partnerships (Figure 1). Over 1,000 stakeholders participated in these workshops. These country workshops have provided

A total of 172 countries, covering roughly 90 per cent of the 193 UN member states, reported on the degree of implementation of IWRM.[11]

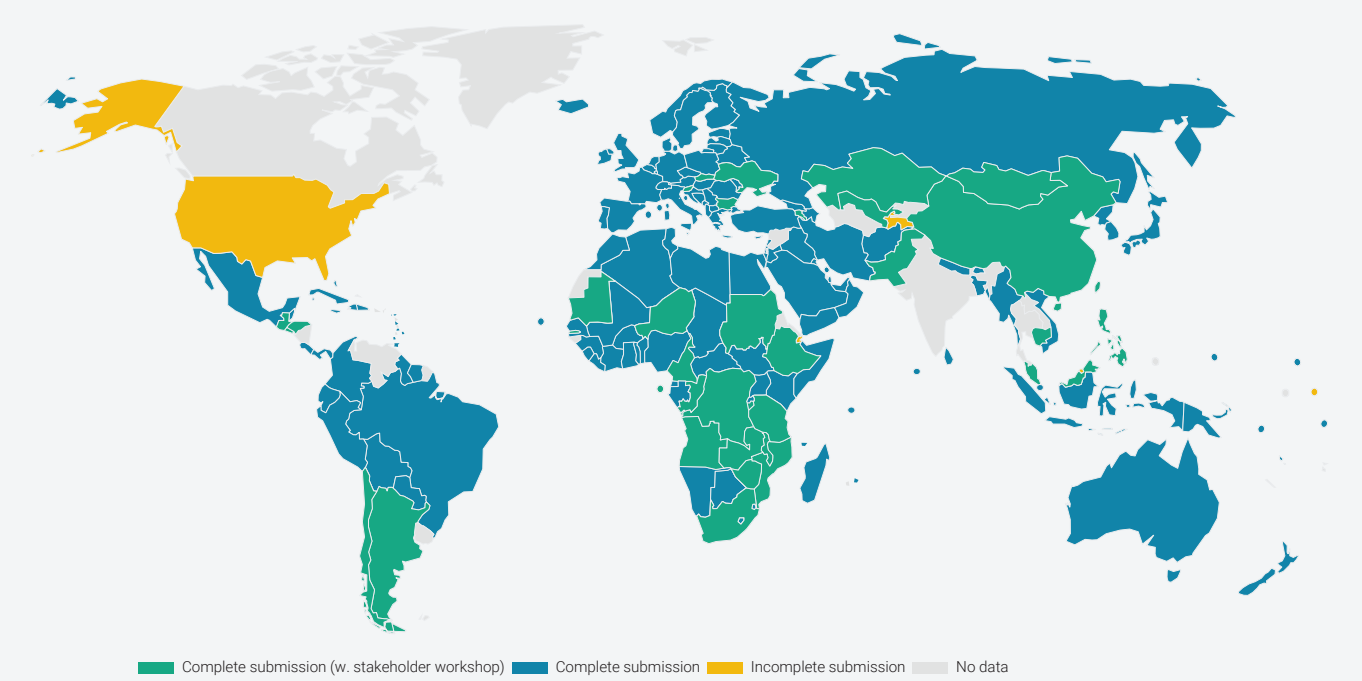

Figure 1 Global overview of country data submissions on SDG indicator 6.5.1, including countries with GWP-facilitated workshops

[10] Inter-agency Expert Group on Sustainable Development Goals Indicators. https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/. Accessed 26 July 2018.

[11] UN Environment supported the national and global data-collection processes by providing online training opportunities for the national focal points, offering in-country support (stakeholder workshops), and establishing a helpdesk. The UN Environment Helpdesk was responsible for the quality assurance of national data submissions, most of which have been revised and finalized in close collaboration with the national focal points (Annex H).

not only a platform for stakeholder discussions and consensus building, but also information on the barriers to implementation, and examples of actions taken to further IWRM in countries (Box 4 below, Section 6.3 and Annex F).

The 172 countries cover more than 80 per cent of the countries in most regions and each Human Development Index group, around 75 per cent of total global population, and around 80 per cent of country area. Notable exceptions in terms of population and/or area include India, Thailand, Canada and the United States (Figure 1, and see Annex D for further information on data coverage).

Each region is well covered by the 172 reporting countries.

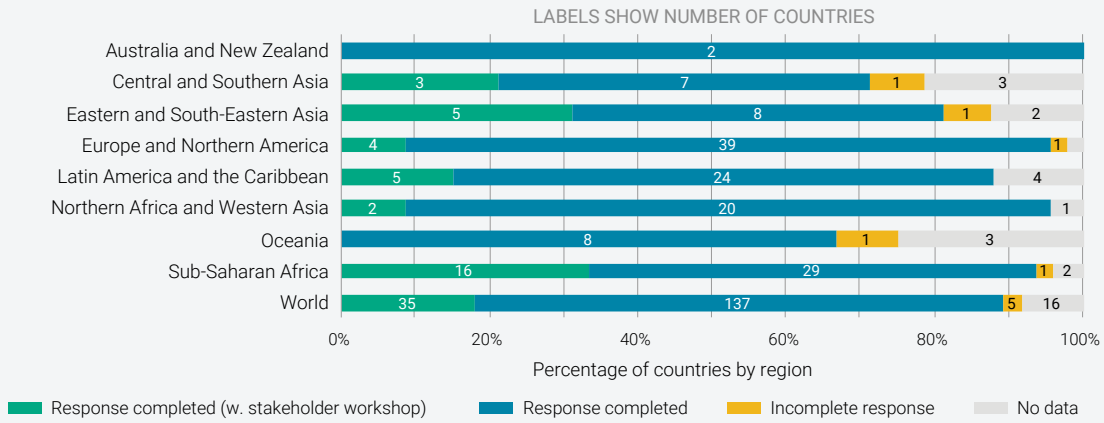

Figure 2 Regional overview of SDG 6.5.1 data submissions, including countries with GWP-facilitated workshops

BOX 4

COUNTRY-LEVEL MULTI-STAKEHOLDER WORKSHOPS WERE AN AGENT OF CHANGE.

In all, 36 countries held multi-stakeholder workshops, facilitated by Country Water Partnerships, to complete the questionnaire. In all cases, the workshop included a range of relevant government ministries and agencies, and some also included other stakeholders such as NGOs, and business. The benefits from the workshop approach were very prominent:

- The questionnaire was seen as a useful tool to assess in an objective way their progress with management and sustainable utilization of water resources using an IWRM approach (e.g. Mozambique, Armenia, Cambodia). However, Sudan participants found the questionnaire too complicated. Tanzania participants expressed a need for a more coordinated approach to monitoring and reporting of all SDG6 targets and indicators.

- In most cases participants discussed, negotiated and finalized scores for the questions at the meeting (e.g. Ukraine, Uzbekistan, Ethiopia, Honduras). El Salvador noted that consensus was greatest when technical data could back the score, as was the case with the issue of management instruments.

- In some cases (probably more but not reported), the process stimulated individuals and groups to work together to help overcome identified problems, to advance progress through their own institutions, or to lobby for change (e.g. Argentina, Chile). Stakeholders in the Gambia agreed that the exercise had raised their awareness on IWRM and its implementation, and participants promised to do their best to advocate for the promotion of IWRM in their various institutions. Zambian participants emphasized that the main takeaway of the process was a recognition that furthering IWRM implementation will positively affect economic, environmental, and human development. Mauritania, Malawi, Mongolia and others provided specific recommendations to advance IWRM.

The results demonstrate how the integrated approach works, in that a negotiated outcome is more likely to reflect reality, garner wider acceptance, and provide focus for the most important next steps.

STATUS OF IMPLEMENTATION OF INTEGRATED WATER RESOURCES MANAGEMENT

3

In line with Target 6.5 ("By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate"), the global, aspirational target for indicator 6.5.1, is to reach a "very high" degree of implementation, or a global average score of 91 to 100. Recognizing that countries are at very different stages of implementation, it may be useful for countries to set national targets, guided by the global level of ambition but considering national circumstances (see Section 6.4).

The general interpretations of the implementation categories for the overall 6.5.1 indicator score, provided below, are based on the threshold descriptions from the individual questions. Individual question thresholds are provided in Annex A-2, and some questions are discussed in Chapter 4.

Table 2 Overall IWRM implementation categories, score thresholds, and interpretation

	Score range	General interpretation for overall IWRM score
Very high	**91 - 100**	Vast majority of IWRM elements are fully implemented, with objectives consistently achieved, and plans and programmes periodically assessed and revised.
High	**71 - 90**	IWRM objectives of plans and programmes are generally met, and geographic coverage and stakeholder engagement is generally good.
Medium-high	**51 - 70**	Capacity to implement elements of IWRM is generally adequate, and elements are generally being implemented under long-term programmes.
Medium-low	**31 - 50**	Elements of IWRM are generally institutionalized, and implementation is underway.
Low	**11 - 30**	Implementation of elements of IWRM has generally begun, but with limited uptake across the country, and potentially low engagement of stakeholder groups.
Very low	**0 - 10**	Development of elements of IWRM has generally not begun, or has stalled.

3.1 COUNTRY AND REGIONAL STATUS

KEY FINDINGS AND RECOMMENDATIONS

1. Country implementation of integrated water resources management ranges from very low to very high, with a global average 6.5.1 score of 49 on a scale of zero to 100:
    - An estimated 40 per cent of countries are implementing most elements of IWRM through long-term programmes (medium-high and above).
    - Another 41 per cent of countries have adopted most elements of IWRM and implementation is underway, but uptake of arrangements and stakeholder engagement may be relatively low (medium-low).
    - The remaining 19 per cent of countries have only started developing elements of IWRM (low and very low).

In total, 60 per cent of countries are at risk of using water resources with negative environmental, social, and ultimately economic consequences unless water resources management implementation is significantly advanced.

2. While this is the SDG baseline, comparison with similar previous surveys indicates that 60 per cent of countries are not likely to reach the global target, at current rates of implementation. **Implementation needs to significantly accelerate in these countries, and they are encouraged to set national targets based on the country context.**

3. Each region contains a spread of IWRM implementation, with medium-high implementation and above in all regions. Latin America and the Caribbean, Central and Southern Asia, Oceania, and Sub-Saharan Africa have the lowest average implementation levels. **There are learning opportunities between regional neighbours with similar political, economic, or cultural contexts.**

Results show that 40 per cent of countries are implementing most elements of IWRM through long-term programmes (medium-high and above), 41 per cent have institutionalized most elements of IWRM and implementation is underway (medium-low), and 19 per cent of countries have started developing elements of IWRM.

Countries per category			Score range	Baseline	Towards 2030
%		Nr.			
4	Very high	7	91 - 100	Countries that have fully established IWRM processes, and review and revise programmes. (4 per cent)	Likely to reach the global target, or have already done so, but will need to remain focussed to consolidate and strengthen gains.
15	High	26	71 - 90	Countries that are generally achieving policy objectives for IWRM. Geographic coverage and stakeholder involvement generally good. (15 per cent)	
21	Medium-high	36	51 - 70	Countries that are implementing most elements of IWRM in long-term programmes. (21 per cent)	Potentially able to reach the global target, but efforts need to be focussed and sustained towards 2030.
41	Medium-low	70	31 - 50	Countries that have institutionalized most elements of IWRM. Implementation is underway, but uptake of arrangements is not widespread. (41 per cent)	**A majority (60 per cent) of countries unlikely to meet the global target unless progress is significantly accelerated.** **Countries should aim to set national targets based on the country context.**
19	Low	32	11 - 30	Countries that have started developing elements of IWRM. Limited uptake across the country and potentially low stakeholder participation. (19 per cent)	
<1	Very low	1	0 - 10		

Figure 3 Global distribution of 6.5.1 scores per IWRM implementation category, based on 172 reporting countries

As this is the SDG baseline for 6.5.1, it is not possible to state whether countries are "on track" to meet the global target. However, findings from similar status reports on integrated approaches to water resources management in 2008 and 2012,[12] as well as experience on the ground, indicate that full implementation of IWRM takes decades to achieve. Therefore, at current rates of progress, the 60 per cent of countries with medium-low implementation and below are unlikely to reach the global target of "very high" implementation (see Chapter 6 for further discussion on progress towards the target, and discussion of national target setting).

[12] United Nations Environment Programme (UNEP) (2012). *The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management.*

A total of 103 countries report medium-low IWRM implementation or below. While some institutional arrangements may be in place, implementation of various arrangements may be limited, with generally low capacity, geographic coverage, and stakeholder participation.

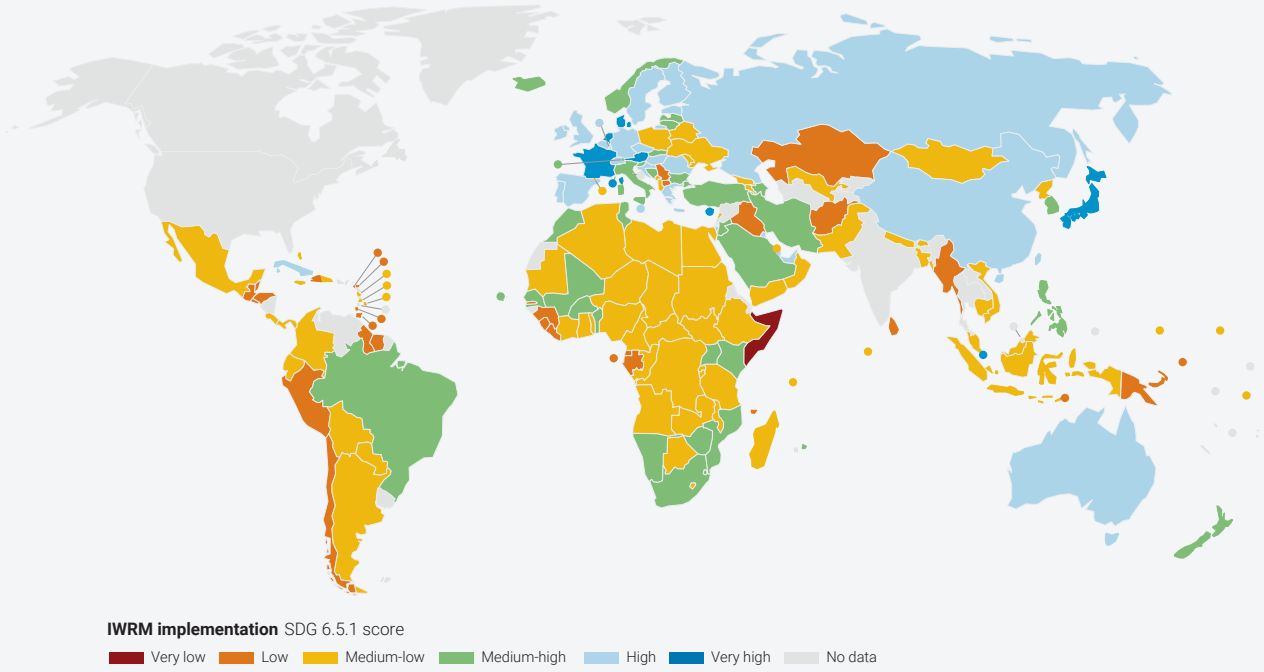

Figure 4 Country implementation of integrated water resources management (categories)

There is a continuum of country scores for indicator 6.5.1 from 10 to 100, with a global average of 49.

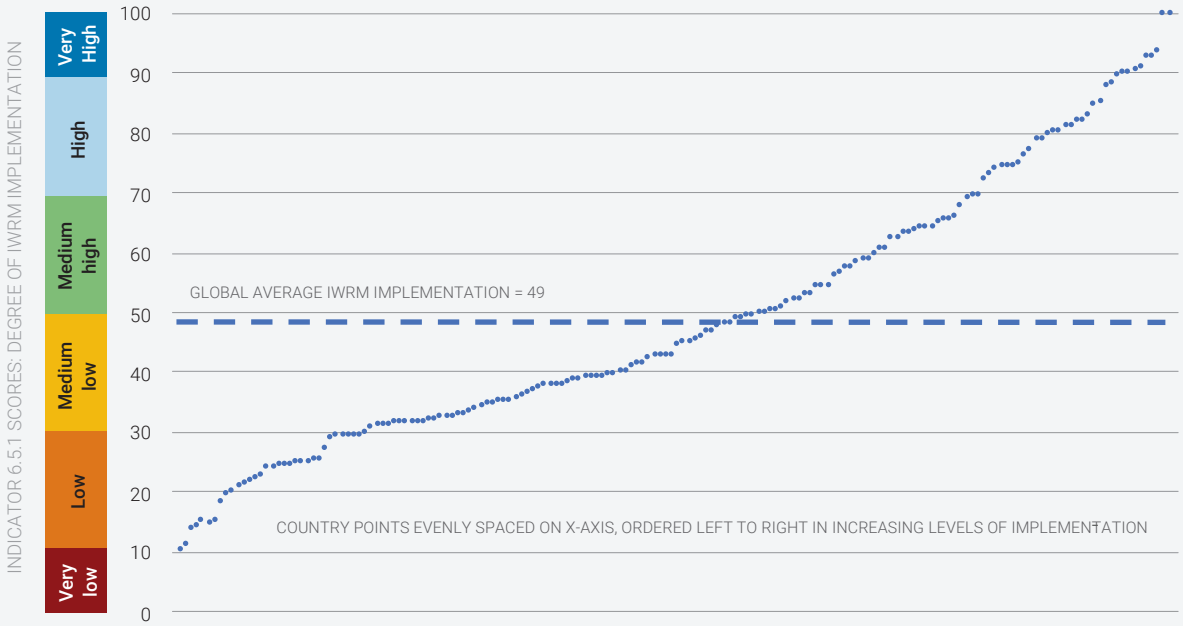

Figure 5 Country implementation of integrated water resources management (scores)

General interpretation of the implementation categories is given in Table 2 and Figure 3. More specific interpretation for each question is provided in the questionnaire, as discussed in Chapter 4.

Each region has countries with a range of IWRM implementation, from low to high in most cases (Figures 4 and 6). This presents learning opportunities and potential peer-to-peer capacity building between countries that may have similar cultural, political and economic contexts.

Figure 6 shows the average scores for the SDG regions,[13] as well as a breakdown of IWRM implementation for countries in each region. Latin America and the Caribbean, Central and Southern Asia, Oceania, and Sub-Saharan Africa have similar average scores (35-40), indicating medium-low implementation on average. Eastern and South-Eastern Asia, Northern Africa and Western Asia, and Europe have medium-high implementation on average, though with a fairly wide spread from 53 to 67.[14] Australia and New Zealand average high implementation (72).

Each region contains a range of IWRM implementation, often providing learning opportunities between neighbouring countries.

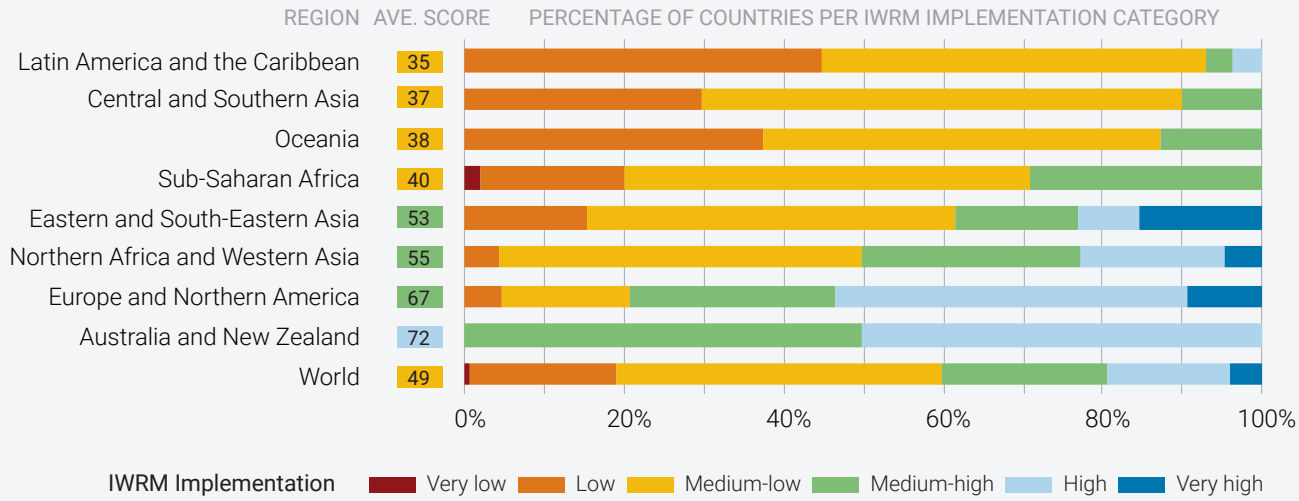

Figure 6 Regional averages and country breakdown of IWRM implementation

The above figure indicates that the level of IWRM implementation is somewhat, but not entirely, linked to overall levels of development. Section 3.3 briefly discusses the factors influencing IWRM implementation.

[13] Standard SDG regions are defined by the United Nations Statistical Division.

[14] While "Northern America" is in the same regional grouping as Europe, neither Canada nor the United States of America have reported on 6.5.1. Therefore, results from this region represent Europe only.

3.2 IMPLEMENTING IWRM AT ALL LEVELS

Implementing IWRM "at all levels" is a key part of SDG target 6.5, as spatial scales are not only closely related, but also interdependent. More specifically, action or inaction at one level can have a direct impact on the quantity and quality of water at another. Given that embarking on IWRM is a decision made by national governments, it is perhaps understandable that the focus of attention typically starts at the national level, with other levels following on. The challenge in this approach is to ensure that IWRM implementation at transboundary and subnational/local levels does not lag the national level to the extent that it hinders development. The following two sub-sections compare implementation at the national level first with subnational/basin/local level (Section 3.2.1) and then with transboundary levels (Section 3.2.2).

KEY FINDINGS AND RECOMMENDATIONS

1. Implementation of IWRM at the subnational level is generally slightly lower than at the national level in all comparable areas. Areas of particular concern include institutional capacity at the basin or aquifer level. **Efforts need to focus on advancing elements of IWRM implementation at subnational, basin, and local levels.**

2. In federated countries, water management tends to be decentralized from the federal to the state level, **though in some cases state differences in capacity and approaches need to be addressed.**

3.2.1 NATIONAL VS SUBNATIONAL, BASIN AND LOCAL LEVELS

Countries have reported that IWRM is being implemented at national, subnational, basin/aquifer and local levels. However, subnational, basin or local implementation lags national implementation in every comparable instance, with differences ranging from 12 points (basin/aquifer institutions) to four points (subnational gender objectives) (Figure 7). These notable differences across the board raise concerns, as resource use takes place and the most hands-on management needs to happen at these lower levels. There are, however, many good examples (Box 5).

Subnational-, basin- and local-level implementation lags national implementation, with capacity of basin and aquifer organizations of particular concern.

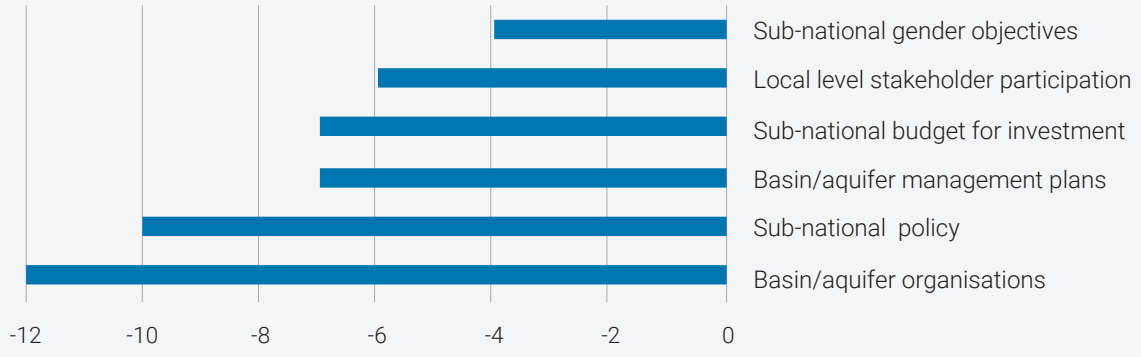

Figure 7 Difference between global average implementation of elements of IWRM at subnational, basin and local levels, compared to the national-level equivalents

BOX 5

EFFECTIVE SUBNATIONAL AND BASIN MANAGEMENT STRUCTURES SUPPORT IWRM.

Managing water using a watershed approach has been adopted widely (Algeria, Armenia, China, Kenya, Zimbabwe) with various titles such as basin commissions, catchment councils who may be elected (Mexico, Morocco, Zimbabwe, Namibia), or supported by a multisector committee (Norway).

Sub-catchment structures are frequently found under the basin level such as watershed committees, community or stakeholder structures (Burkina Faso, Kenya, Mexico). In the case of Bangladesh, which has no basin organizations, the country's "Guidelines for Participatory Water Resources Management" led to the formation of around 2,000 water management organizations at the local level.

Countries with a lower level of IWRM implementation may not have any subnational water management structures yet in place (DR Congo, Cameroon, Equatorial Guinea, Niger, Madagascar, Timor-Leste). The presence of subnational water management structures suggests that local water management exists, but that, in many cases, its full potential is not realized because of various capacity constraints (Argentina, Armenia, Guatemala, Guyana, Zimbabwe).

Federated countries

Water resources management in federated states can have an extra layer of complexity (Box 6). The 27 federated states that reported on 6.5.1 address two questions specifically related to institutions (q.2.2f) and laws (q.1.2d) at the provincial/state level in federated countries. For other elements of IWRM, questions at subnational level are likely to refer to the provincial/state level for federate countries. For these two questions, implementation is comparable to the national level, with country scores ranging from zero to 100, and global averages of 55 and 59, respectively. However, the federated countries which reported on 6.5.1 tend to have levels at the two extremes of development (either high or low levels), and, hence, the degree of IWRM implementation tends to be concentrated in the top and bottom two implementation categories, with far fewer countries in the middle two categories.

BOX 6

WATER MANAGEMENT IS DECENTRALIZED IN FEDERATED COUNTRIES.

In federated countries water management has usually been decentralized, and is a responsibility of each State. Argentina has 24 jurisdictions each with the responsibility to lead IWRM implementation but with varying capacity when the regulatory process has not been coupled with the implementation of the management instruments and resources. A similar situation was reported for Malaysia with the added complication that state water resource-related enactments differ in jurisdiction, scope and powers, which may lead to gaps, conflicts and duplication in the enactments with federal and neighbouring state laws.

Mexico may have avoided some of these problems when the National Water Commission proposed to each state a model state water law that included the concept of IWRM to promote the coordinated management and development of water, land, and resources without compromising the sustainability of vital ecosystems. Sudan also prepared a framework law to guide states to develop its water laws. Its Water Law of 1995 delegated states to manage aquifers and watersheds within their respective jurisdictions under state water corporations. However, these institutions have little capacity to develop IWRM plans.

State water-related laws are fully implemented across the United Arab Emirates, and authorities have the capacity to effectively lead periodic IWRM plan revision. Similarly, in Micronesia, water contamination and pollution laws are approved and enforced in most states, which have the authority to act for the conservation of water resources through site-based management systems and protected-areas networks.

3.2.2 TRANSBOUNDARY IMPLEMENTATION OF IWRM

KEY FINDINGS AND RECOMMENDATIONS

1. Approximately three quarters of countries with shared waters report that they have established some form of agreements, organizational frameworks, data sharing and financial arrangements for transboundary water management. However, the degree of implementation, or operationalization, of these aspects varies greatly:
   - For transboundary arrangements such as treaties, conventions or agreements, almost half of all countries report limited implementation of the provisions in these arrangements, while about a third of countries report implementing most of the provisions.
   - For transboundary organizational frameworks such as joint bodies, joint mechanisms and commissions, 40 per cent of countries report only partly fulfilling the organizations' mandates, with 37 per cent of countries mostly or fully fulfilling the mandates.
   - For transboundary data and information sharing, 57 per cent of countries report some data and information sharing according to arrangements, while only 20 per cent report effective data and information sharing.
   - For agreements on financing for transboundary cooperation, almost half of countries report providing less than 50 per cent of agreed funds, and a third of countries report providing more than 50 per cent of agreed funds.

Significant effort is needed to ensure that arrangements are fully implemented and operational.

2. Estimates are likely to be optimistic because countries have been asked to report only on the status of transboundary water management for the majority of what they consider to be their most significant transboundary basins and aquifers. **Cross-reference with SDG indicator 6.5.2 on transboundary cooperation, and future harmonization of reporting approaches between the two indicators are needed.**

3. There are significant differences in reported levels of transboundary implementation of IWRM between neighbouring countries, indicating potential differences in priorities and perceptions concerning shared basins and aquifers. Neighbouring country differences are also found in SDG indicator 6.5.2. **Increased dialogue and harmonization between countries on reporting is encouraged, and can be used a platform for enhanced understanding and cooperation.**

In the survey, 132 countries report on transboundary-level issues by answering four main questions, one for each of the four main aspects of IWRM: [15]

- Arrangements (q.1.2c): such as treaties, conventions, agreements or memorandum of understanding
- Organizational frameworks (q.2.2e): such as joint bodies, join mechanisms or commissions
- Data and information sharing (q.3.2d): institutional and technical mechanisms in place
- Financing for transboundary cooperation (q.4.2c). (see Figure 9 for results)[16]

[15] While 132 countries report on the question regarding transboundary data and information sharing (q.3.2d), the remaining 40 respond "not applicable" ("n/a"). However, the number of countries reporting on the other transboundary questions varies: arrangements = 128 countries; organizational frameworks = 126 countries; financing = 116 countries. Furthermore, a few countries that share transboundary basins or aquifers with other countries report "n/a", and one island state reports on transboundary questions. To address this variability in the next round of data collection, further explanation may be required in the survey, as well as more rigorous quality-control procedures.

[16] A fifth question addresses gender objectives at the transboundary level, though almost twice the proportion of countries report "not applicable" for this question compared to the other transboundary-level questions. This question is addressed in Section 4.3.

With 153 countries sharing over 600 transboundary rivers, aquifers and lakes, transboundary cooperation is essential for sustainable development.[17,18] Most countries have some transboundary arrangements in place, though priorities and capacities differ within countries sharing the same waters. As illustrated by indicators 6.5.1 and 6.5.2, a significant effort is needed to ensure that such arrangements are fully implemented and operational.

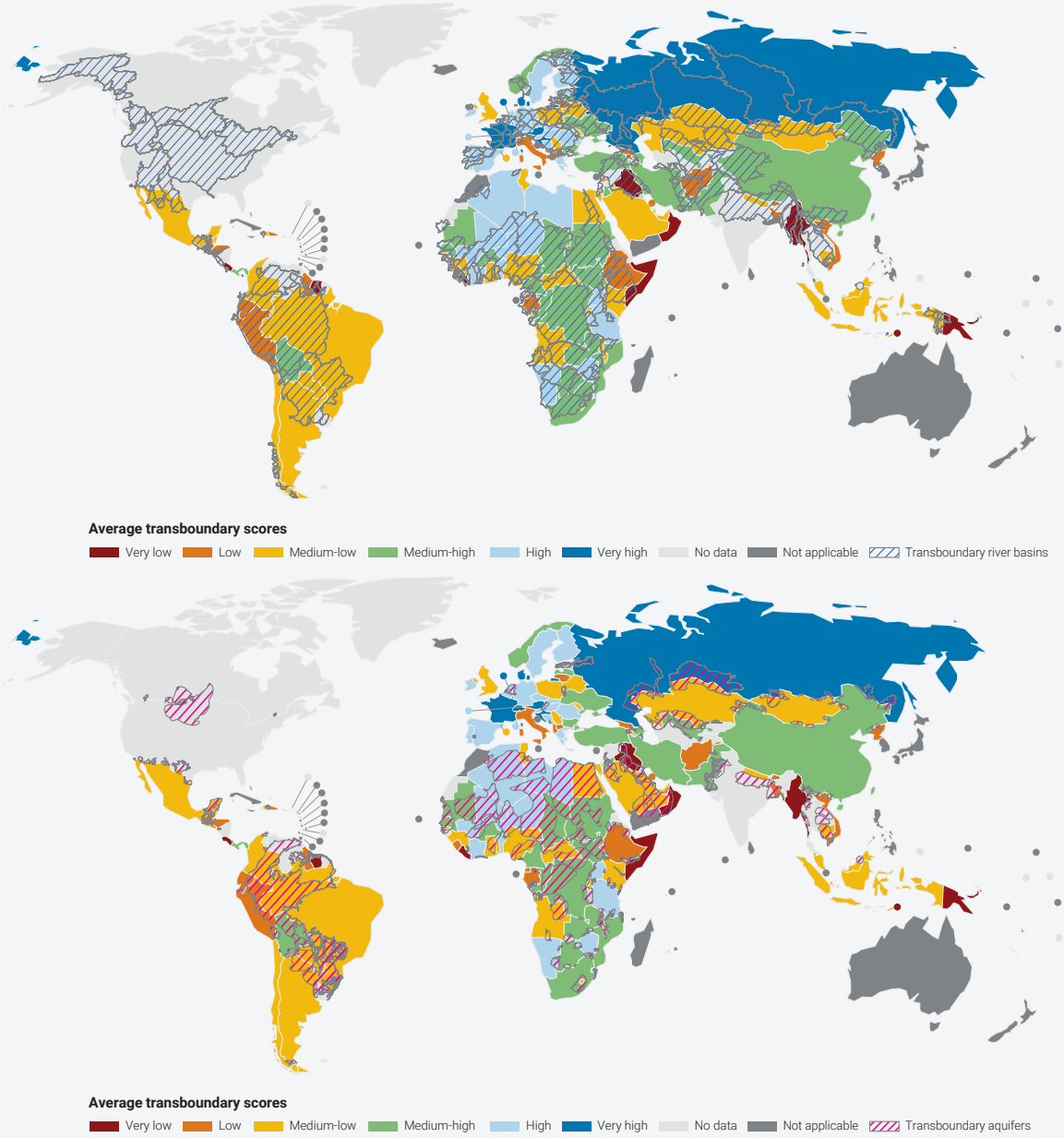

Figure 8 Country scores for average transboundary-level implementation, overlaid with transboundary basins (top) and aquifers (bottom)

The above figures show some basins and aquifers with considerable differences on the average levels of implementation of transboundary elements across countries. This implies that countries sharing a basin or aquifer may have different perspectives on either the importance of transboundary cooperation, or on the status of transboundary cooperation. There may also be differences in capacity and strength of the respective national enabling environments and institutions. These differences need to be investigated in more detail, cross-checked with the results of SDG indicator 6.5.2, and addressed by the countries concerned, to achieve effective and transparent transboundary cooperation.

[17] United Nations Economic Commission for Europe (ECE) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2018). *Progress on Transboundary Water Cooperation – Global baseline for SDG 6 indicator 6.5.2.*

[18] United Nations Environment Programme (UNEP) (2016). *Transboundary Waters Systems: Status and Trends: Crosscutting Analysis.* Transboundary Waters Assessment Programme (TWAP), Volume 6. Nairobi.

Approximately three quarters of countries report having established some form of agreements, organizational frameworks, data sharing (all medium-low and above) and financial arrangements (low and above) for transboundary water management, but the likely coverage and degree of implementation vary greatly (see also key findings).

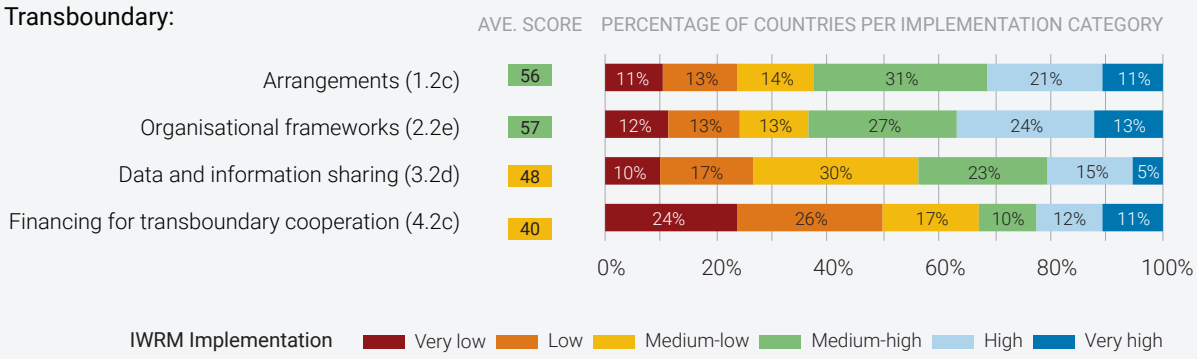

Figure 9 Transboundary-level implementation of IWRM elements

Table 3 General interpretation of transboundary implementation categories for four questions

	Very High	High	Medium-high	Medium-low	Low	Very low
Arrangements / organizational frameworks / data and info sharing	**Fully** implemented, mandates fully fulfilled.	**Mostly** implemented, mandates mostly fulfilled	**Partly** implemented, mandates partly fulfilled.	Adopted	Being developed	None
Financing arrangements	Agreed contributions fully met.	Funding more than 75% of agreed contributions.	Funding less than 75% of agreed contributions.	Funding less than 50% of agreed contributions.	Adopted	None

Significant effort is needed to ensure transboundary arrangements are fully implemented. Juba, South Sudan, on the Nile River.
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Countries report a range of drivers and enablers for transboundary-level implementation of IWRM (Box 7):

- Regional frameworks and platforms: such as the revised protocol on shared water resources in the Southern African Development Community (SADC) (Botswana, Democratic Republic of the Congo, Lesotho, Malawi, Swaziland, Zambia, Zimbabwe), the EU Water Framework Directive (France, Germany, Greece), and the Economic Community of West African States (ECOWAS) (Benin, Burkina Faso).

- International conventions: the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention), and the UN Convention on the Law of the Non-navigational Uses of International Watercourses (Bosnia and Herzegovina, Croatia, France, Greece, Lithuania, Slovakia, Slovenia, Ukraine, Uzbekistan).

- National processes and priorities: such as IWRM plans, information systems, and financing arrangements that can contribute to transboundary cooperation (Burkina Faso, Guyana, Guatemala, Slovenia).

- Donor or third-party facilitated activities: Bosnia and Herzegovina (Sava River Basin), Kazakhstan, Sierra Leone.

While notable progress has been made in many transboundary basins and aquifers, the results from 6.5.1 and 6.5.2 both suggest that a significant effort is needed to strengthen transboundary water cooperation (Box 8).

SDG indicator 6.5.2 measures the proportion of transboundary basin area in each country with an operational arrangement for water cooperation. For SDG indicator 6.5.2, four criteria are used to determine whether the arrangements are considered "operational": a joint body or mechanism must exist; meetings between countries must be held at least annually; joint management plans or objectives must have been set; and exchanges of data and information must take place at least annually. Based on the 62 countries where data are available on indicator 6.5.2, the average national proportion of transboundary basin area covered by an operational arrangement is 59 per cent (though results range from zero to 100 per cent).[19]

The "high" and "very high" implementation categories from the 6.5.1 questions can be compared with "operational" arrangements measured by 6.5.2. Only around one third of the 132 countries that report on the transboundary questions for 6.5.1, report high to very high implementation of arrangements and organizational frameworks, and only one fifth of those countries report high to very high levels for data and information sharing and financing arrangements. This is comparable to results from 6.5.2, where roughly one third of countries reported having operational arrangements in place for 90-100 per cent of their transboundary basin area. However, in 6.5.1, countries could decide which were the "most important" transboundary basins and aquifers in terms of economic, social or environmental value to the country (or neighbouring countries). Furthermore, only the majority of the basins and aquifers had to meet the criteria in the threshold descriptions. Thus, the representation of transboundary-level implementation in 6.5.1 may be an over-estimation. These issues should be considered in future review of the 6.5.1 survey.

Country reporting and data analysis for indicator 6.5.1 and 6.5.2 occurred simultaneously, so opportunities for detailed cross-analysis have been limited by the time frame of this reporting cycle. However, initial analysis has revealed a strong agreement

BOX 7

INTEGRATED WATER RESOURCES MANAGEMENT PROVIDES A FRAMEWORK FOR TRANSBOUNDARY COOPERATION.

Several countries reported having developed IWRM plans at the transboundary basin level. For instance, Bolivia and Peru have developed IWRM plans for the Titicaca-Desaguadero-Poopó-Salar de Coipasa System (TDPS). In 2017, Colombia and Ecuador adopted a binational plan related to IWRM in the Carachi-Guaitara and Mira-Mataje basins. An agreement on IWRM for all basins shared between Ecuador and Peru is being developed. In the lower Mekong, an IWRM project is being implemented under the auspices of the 1995 Mekong Agreement. In 2007, countries of the Congo-Uubangui-Sangha basin adopted a protocol to the 1994 Congo Basin accord related, in part, to the implementation of IWRM. A basin-wide IWRM plan has been developed in the Orange-Senqu Basin through the Orange-Senqu River Commission (ORASECOM). A joint technical committee for IWRM has been operational in the Volta basin since 2007. In June 2016, Azerbaijan and Georgia initiated a project to advance IWRM across the Kura River Basin.

[19] United Nations Economic Commission for Europe (ECE) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2018). *Progress on Transboundary Water Cooperation – Global baseline for SDG 6 indicator 6.5.2.*

between the two indicator results for many countries. For others, differences may be due to variation in methodologies, reporting processes, and stakeholder involvement, expertise, and opinions expressed. Opportunities for harmonizing the indicator methodologies and reporting processes should be investigated before the next round of data collection.

3.3 FACTORS INFLUENCING IWRM IMPLEMENTATION

Although most regions contain countries with a wide range of implementation levels, a number have made more limited progress. Not surprisingly this group includes many less-developed countries, but surprisingly also includes a number of more-developed countries. In addition, some less-developed countries have achieved a comparatively advanced level of implementation. This situation warrants closer analysis.

The Human Development Index (HDI) is a summary measure of achievement in key dimensions including life expectancy, education and standard of living.[20] In contrast to measures such as GDP that focus on economic development, HDI reflects a country's capacity to implement health and education measures. If a country has capacity in these areas, then in theory it also has the capacity to implement IWRM, even if the level of economic development is not that high, and even if countries are likely to prioritize health and education

KEY FINDINGS

1. While overall levels of development, wealth, and governance obviously have an influence on levels of IWRM implementation, they are not necessarily the most important factors. This may imply that the level of political engagement and priority given to IWRM implementation is an influencing factor.

2. About 30 countries have high or very high IWRM implementation (scores of 71 to 100), and very high Human Development Index scores. This implies that most countries that reach the highest levels of IWRM implementation have a certain level of development.

3. Geophysical factors such water scarcity, country area, and population size do not appear to be strong influences on IWRM implementation globally, though they may be drivers for some countries.

BOX 8

TRANSBOUNDARY-LEVEL COOPERATION IS COMMON, BUT NOT UNIVERSAL.

Most countries with transboundary rivers, lakes and aquifers report one or more transboundary agreements. Large rivers and aquifers (Zambezi, Mekong, Niger, Nile rivers, and North Western Sahara Aquifer System and Guarani Aquifer) have transboundary agreements in place, and varying levels of cooperation and management. Algeria has surface water management agreements with Tunisia and Morocco. Azerbaijan has agreements with Russia and Iran. Transboundary cooperation is well developed in Europe where several large rivers such as the Danube and the Rhine cross many countries, and river basin management plans and flood risk management plans have been established along with well-functioning institutions. Usually cooperation is at the highest level of ministers or Heads of State.

Armenia was an exception in explicitly identifying political factors as a reason for lack of cooperation with some of its neighbours, though this is likely to be the case in other situations. Bangladesh has 57 transboundary rivers (54 enter from India, and three from Myanmar) but only one transboundary agreement. The agreement, for sharing the water of the Ganges River, has been signed with India. As a result, Bangladesh reports very limited hydro-meteorological data/information sharing to manage water-related disasters such as flooding, riverbank erosion and drought, and other water management issues such as irrigation, environmental flow, water allocation, and pollution.

[20] United Nations Development Programme (2016). Human Development Index. http://hdr.undp.org/en/content/human-development-index-hdi. Accessed 26 July 2018.

over IWRM. Figure 10 compares countries' IWRM scores with their HDI scores and shows some interesting results. Countries in the low, medium and high HDI groups exhibit a very similar spread of IWRM implementation (the line of best fit is relatively flat through these HDI groups).[21] In the very high HDI group, most countries exhibit a rapid increase in IWRM implementation, though there are exceptions. The figure facilitates the identification of those countries that are likely to have potential to improve (those below the line of best fit), and those countries that are performing above average in their HDI group (those above the line of best fit).

A cluster analysis can identify groups of countries with similar characteristics across a number of parameters.

A cluster analysis was used to investigate the relationship between IWRM score, HDI score, and the Fragile States Index.[22] This index was chosen as a proxy indicator for several factors such as economic, political, and social stability. Four groups of countries emerge, as shown in Figure 10:

1. Group 1, top-left: those with low to high HDI, yet medium-high IWRM implementation. These countries appear to have more advanced IWRM implementation compared to the average for similar levels of development.

2. Group 2, bottom-left: those with low and medium HDI, with low IWRM implementation. These countries are likely to be facing a range of current or

While overall levels of development, wealth, and governance obviously have an influence on levels of IWRM implementation, they are not necessarily the most important factors. However, only countries with "very high" HDI have reported very high IWRM implementation.

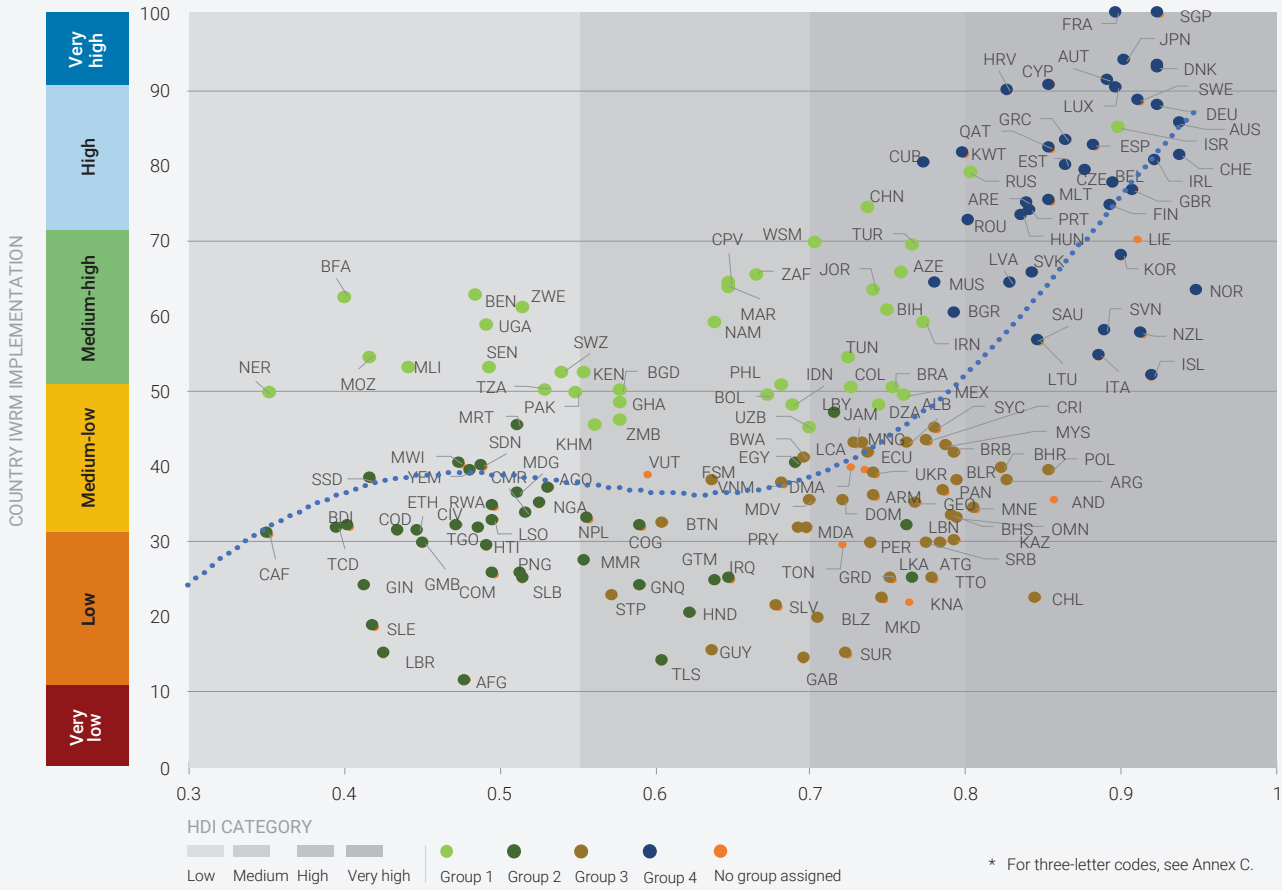

Figure 10 Degree of IWRM implementation by HDI score[23, 24]

[21] HDI explains about half the variation in IWRM implementation (Pearson's correlation coefficient 0.56).

[22] The Fund for Peace (2018). Fragile States Index. http://fundforpeace.org/fsi/. Accessed 26 July 2018.

[23] While a degree of subjectivity in country reporting is acknowledged, this was addressed through a range of measures (Section 2.2).

[24] Six countries did not have HDI values in 2017, so they are not included in this figure (IWRM scores in brackets): Somalia (10), Marshall Islands (33), Democratic People's Republic of Korea (38), Tuvalu (47), San Marino (66), Monaco (90). Seven countries were not assigned a group in this analysis as they did not have Fragile State Index values (orange markers).

historic political instability or conflict, and have the highest average Fragile States Index.

3. Group 3, bottom-right: those with high HDI, yet medium-low or low IWRM. There may be other reasons why these countries have not reached a higher level of IWRM implementation, despite theoretically having the capacity and resources to do so.

4. Group 4, top-right: those with very high HDI and high IWRM. These countries appear to have more advanced IWRM than many others with similar HDI.

To investigate if there are other factors that influence the implementation of IWRM, some correlation analyses and cluster analyses were undertaken for a range of parameters. These included factors related to levels of development and governance such as: PPP-adjusted GDP,[25] Corruption Perceptions Index,[26] Fragile States Index,[27] Human Development Index (HDI), the Worldwide Governance Indicators[28], and level of water-related Official Development Assistance (ODA); and geophysical parameters such as country area, population size, and water stress.

In general, the governance and development-related parameters resulted in similar groupings of countries, which are broadly comparable with the four groups described above. Countries in the "top right", with both very high HDI and high IWRM, appear to be most closely related; namely, they are generally wealthy, and have effective, stable governance, and low perception of corruption. However, countries in other groups appear to be less similar, implying that such parameters are not necessarily a barrier or enabler of IWRM implementation, but perhaps political will may be an important factor.

No strong patterns emerged in relation to the geophysical parameters. There appears to be very little correlation between IWRM implementation and water scarcity, population size, or country area. This implies that these parameters do not strongly influence the degree of IWRM implementation.

Of the countries in the very high HDI group, 87 per cent report at least medium-high IWRM implementation. In the other three HDI groups, less than 25 per cent of countries had reached this level of implementation (Figure 11). Fortunately, the countries with at least medium-high implementation in each HDI group, and region, may provide opportunities for learning for countries in similar situations.

HDI is clearly not the sole factor determining level of progress. Many of the less-developed countries with higher implementation scores have placed strong focus on IWRM in recent years. This suggests that political support for promoting IWRM implementation is also a key factor (Box 9). Further analysis on the factors influencing IWRM implementation is warranted, as it may shed more light on enablers to progress.

IWRM implementation in countries with low, medium and high HDI levels is similar, with a significant increase in IWRM implementation in the very high HDI group.

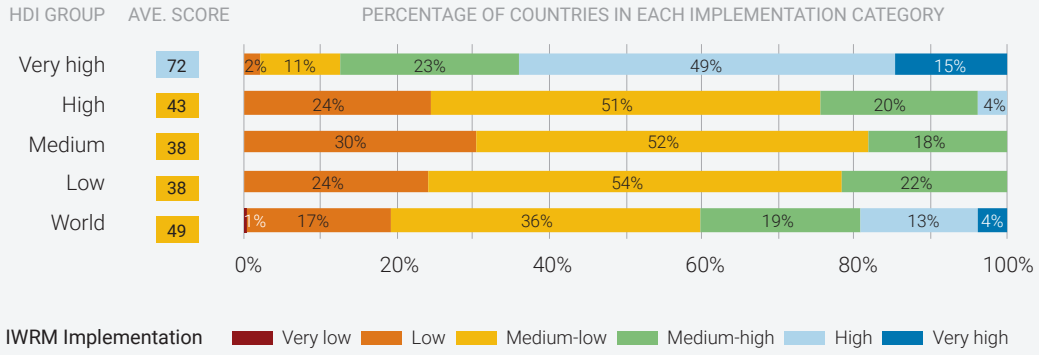

Figure 11 IWRM implementation by HDI group

[25] PPP = Purchasing-Power Parity, GDP = Gross Domestic Product.

[26] Transparency International. Corruption Perceptions Index 2017. https://www.transparency.org/news/feature/corruption_perceptions_index_2017. Accessed 26 July 2018.

[27] The Fund for Peace (2018). Fragile States Index. http://fundforpeace.org/fsi/. Accessed 26 July 2018.

[28] Including six indicators: voice and accountability, political stability, regulatory quality, rule of law, control of corruption, government effectiveness. World Bank. World-wide Governance Indicators project. http://info.worldbank.org/governance/wgi/#home. Accessed 26 July 2018.

BOX 9

HDI STATUS NEED NOT BE A BARRIER TO IWRM IMPLEMENTATION.

Burkina Faso and Zimbabwe are two examples of countries of low HDI status reporting high levels of IWRM implementation.

Burkina Faso (overall score 63) established a water policy in 1998, adopted a water management act in 2001, and is now implementing the third phase of its national IWRM action plan. Under its five water management areas, sub-basin committees with community representation meet to agree action plans. However, financial resources are uncertain and well below desired levels. Payments for water only cover a small part of the water management costs.

Prior to 2010 Zimbabwe (overall score 61) established the National Water Authority and several catchment councils with development plans all within an IWRM policy framework. These water management structures, which include stakeholder participation, face limitations on capacity and financial resources that have severely constrained implementation of management systems and plans.

These two countries show that the foundations for sustainable management of water resources can be established even under adverse economic conditions. Impact on the ground will take much longer and require much support but there is a basis for action at scale as the economy improves. Furthermore, once these foundations have been laid, they offer resilience to other pressures, such as economic or political instability.

ELEMENTS OF INTEGRATED WATER RESOURCES MANAGEMENT IMPLEMENTATION

Effective implementation of integrated water resources management involves a wide range of elements, from establishing a water quality monitoring system, to engaging with the private sector, to creating laws that address the equitable and sustainable use of water resources. The major elements, relevant to most countries, are captured through the 33 questions in the 6.5.1 questionnaire, arranged into the four main aspects of: enabling environment, institutions, management instruments, and financing (see Section 2.1 and Annex A for more detail). This section first compares the four main aspects of IWRM implementation (Section 4.1), then goes into each aspect in more detail (Sections 4.2 to 4.5). Country examples are provided in boxes throughout.

Note that the order of presentation of enabling environment, institutions, management instruments, and financing does NOT imply an order of priority for implementing integrated water resources management (Box 10).

4.1 COMPARISON OF THE FOUR MAIN DIMENSIONS OF INTEGRATED WATER RESOURCES MANAGEMENT

KEY FINDINGS AND RECOMMENDATIONS

1. Most countries report similar levels of implementation for: policies, laws, and plans; institutions and participation; and management instruments. The global averages of these three dimensions are similar (51-53), though with wide variation between countries.

2. Roughly twice the proportion of countries report very low or low implementation of financing, compared to the other three main dimensions of IWRM (40 per cent compared to 20 per cent). The global average implementation of financing (41) is about 10 points lower than the implementation levels of the other three dimensions. **Financing needs to increase for water resources management and monitoring, particularly through improved cost-recovery.**

BOX 10

IMPLEMENTING IWRM IS NOT NECESSARILY A SEQUENTIAL PROCESS.

Countries that give themselves a low score on the enabling environment for IWRM ("have not established or fully implemented a formal IWRM policy, law or plan") may still report significant levels of implementation in terms of management instruments, institutions or funding (Andorra, Barbados, Costa Rica, Dominica, Iraq, Jamaica, Ghana, Saudi Arabia).

In Andorra, management instruments score in the medium-high range; water quantity and quality balances, surveys of wetlands and riparian vegetation are carried out annually. In Dominica, telemetry assists in water monitoring. Barbados has a long-running system of regular groundwater monitoring for quantity and quality; it applies block water tariffs, and monitors swamps and springs. Though Ghana has no clear-cut water resources law, it has a national IWRM plan and basin water management boards in place. Costa Rica has legal, technical and economic mechanisms to carry out groundwater monitoring, improve water use efficiency, and control water pollution, though national IWRM policies and plans are not yet implemented.

These examples show that water managers are able to maintain and advance good water management practices under existing legal and institutional systems. These experiences demonstrate that it is not necessary to see IWRM as a linear process from laws to institutions to instruments to financing as implied by the structure of the questionnaire.

Adoption of effective water management systems is essential to enable better water allocation, pollution control and/or improved water use efficiency. IWRM principles may influence the objective of these decisions and how they are made, but the management instruments are required regardless of whether IWRM principles are applied.

The global average implementation scores are similar for policies, laws and plans (51), institutions and participation (53), and management instruments (51). Financing lags the other dimensions by about 10 points (41) (Figure 12).

Financing lags the other three main dimensions of IWRM implementation by about 10 points.

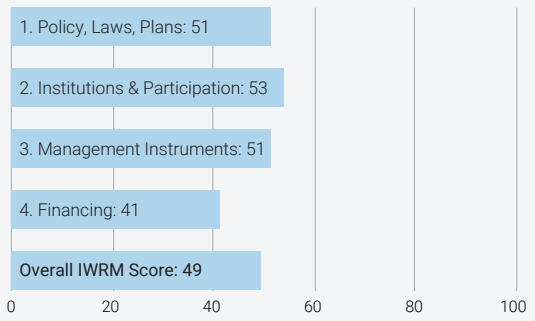

Figure 12 Global average implementation of the four main dimensions of IWRM, and overall IWRM implementation

However, these are global averages. At the country level, section average scores range from zero to 100, showing the need for each country to carefully assess their own strengths and weaknesses for progressing with IWRM implementation. About one third of all countries are in the medium-low implementation category (average scores of 31-50) for each section (Figure 13). About 20 per cent of countries are in the high or very high implementation categories. Interpretation of the implementation categories depends on the threshold descriptions for each question, as shown in the questionnaire (Annex A-2). Sections 4.2 to 4.5 discuss this issue.

In each of the four main dimensions of IWRM, implementation at the national level is seven to three points above implementation at other levels, including subnational, basin, local, and transboundary (see Figure 14 and Section 3.2 for more information).

For the first three dimensions, about 50 per cent of countries average medium-low or lower levels, and 50 per cent of countries average medium-high levels or above. For financing, 70 per cent of countries average medium-low or lower levels, and 30 per cent average medium-high levels or above.

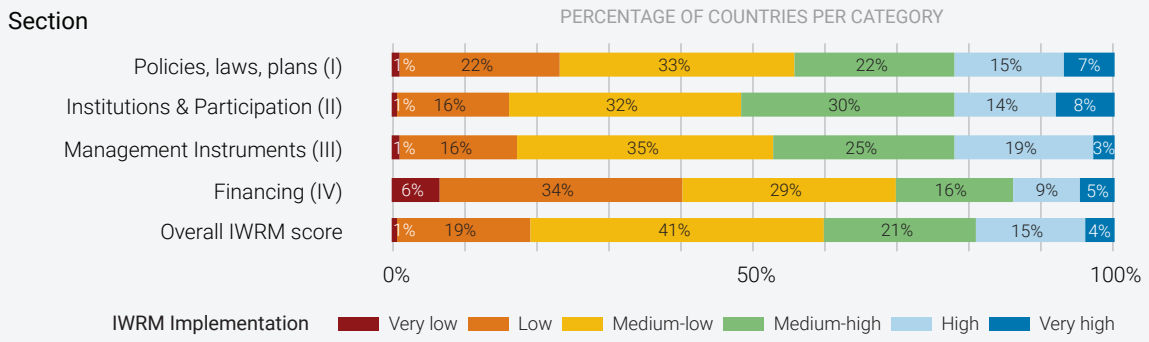

Figure 13 Percentage of countries in each implementation category, across the four main dimensions of IWRM

For the first three dimensions, the countries in the very high HDI group have average scores of just over 70, approximately 30 points above implementation scores of countries in the other three HDI groups. Average implementation of financing is about 10 points lower in each case (Figure 15).

Global average implementation at the national level is seven to three points higher than implementation at "other" levels.

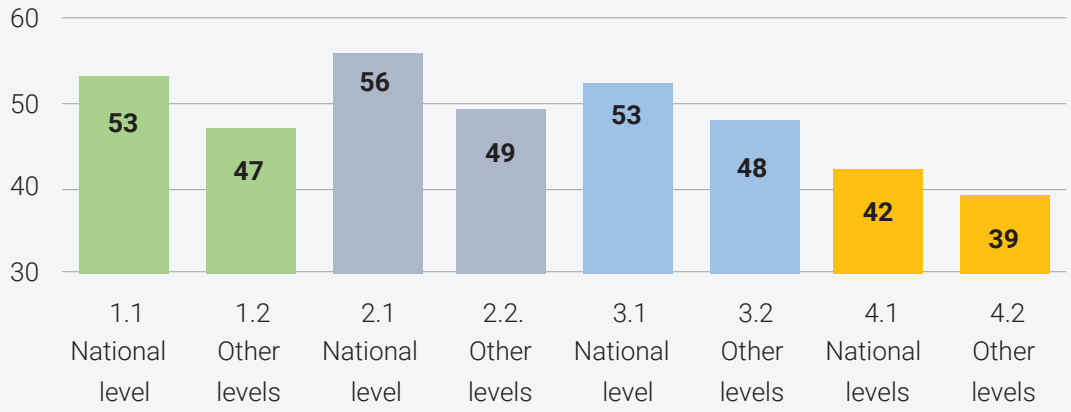

Figure 14 Differences between implementation at the national level and "other levels" for each of the four main dimensions of IWRM

Countries whose HDI levels range from low to high show similar levels of implementation across the four main dimensions of IWRM. Only the very high HDI group has considerably higher implementation.

Figure 15 Global average implementation of the four main dimensions of IWRM, by HDI group

4.2 LAWS, POLICIES AND PLANS (SURVEY SECTION 1)

KEY FINDINGS AND RECOMMENDATIONS

1. In approximately 50 per cent of countries, national policies, laws and plans have reached medium-high implementation, indicating that the majority of relevant authorities are applying these measures. **Attention should focus on the other 50 per cent of countries that have not yet reached medium-high implementation to ensure that the enabling environment for IWRM is established.**

2. While 37 per cent of countries report that basin or aquifer plans are based on integrated approaches approved by authorities and being implemented in the majority of basins/aquifers (medium-high, high or very high implementation), another 47 per cent report that basin/aquifer plans are either being prepared, or development of plans has not yet started or has been delayed in the majority of basins/aquifers (low or very low implementation). **Significant efforts are needed in half of all countries to ensure that basin and aquifer management plans and programmes are completed so that implementation can begin.**

Policies, laws and plans provide the enabling environment for implementation of integrated water resources management. This section covers: national policies (q.1.1a), laws (q.1.1b), and IWRM plans (q.1.1c), and subnational policies (q.1.2a), basin and/or aquifer management plans (q.1.2b), arrangements for transboundary water management (q.1.2c), and provincial/state laws in federated countries (q.1.2d). The distribution of country scores is shown in Figure 16.

The global average implementation levels of national water resources policies (55) and laws (56) are very similar. This indicates that, on average, policies and laws are based in IWRM principles, and that a significant proportion of authorities use and apply these measures. The implementation of provincial or state laws in federated countries is slightly higher than the global national average. The average score for implementation of IWRM plans, or similar, is slightly lower (49), indicating that the plans are approved by government, and authorities are starting to implement them (Box 11).

The average score for implementation of subnational policies is 10 points lower than scores at the national level, implying that subnational implementation often follows national implementation (Section 3.2.1). Although the implementation of basin or aquifer management plans appears to be relatively low (42, Q1.2b), this degree of implementation (medium-low) still indicates that plans are approved in the majority of basins and aquifers, and that authorities are starting to use them. In fact, 37 per cent of countries report that basin or aquifer plans based on integrated approaches, approved by authorities, are being implemented in the majority of basins/aquifers (medium-high and above) (Figure 18). However, 47 per cent of countries report that basin/aquifer plans are either being prepared, or that development of plans has not yet started or has been delayed in the majority of basins (Box 12) or aquifers (Box 17, section 4.3). The importance and status of aquifer management is discussed in more detail in Section 4.4.

Most countries report having policies, plans and laws based on integrated principles in place and approved by relevant authorities at all levels (medium-low implementation and above).

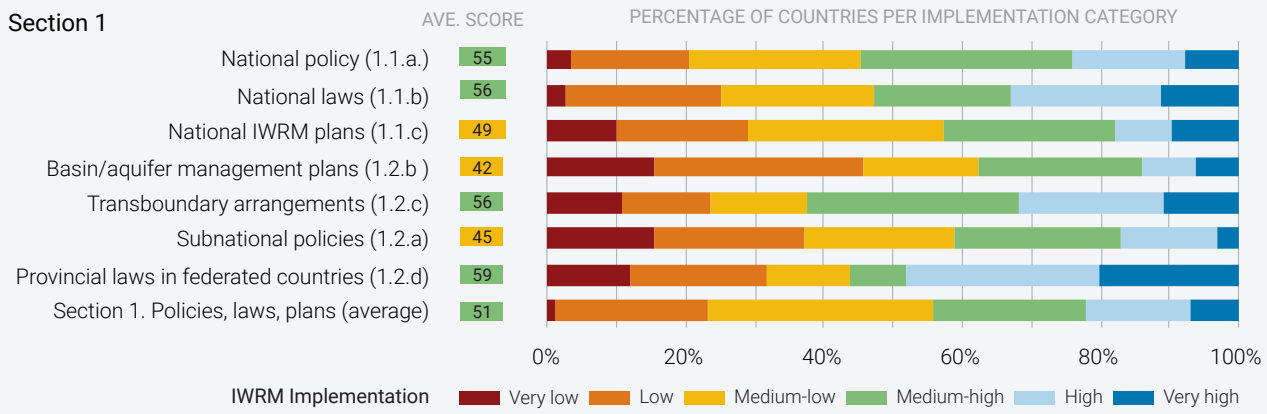

Figure 16 Implementation of policies, laws and plans, based on integrated approaches to water resources management

BOX 11

STRENGTHENING THE ENABLING ENVIRONMENT IS A KEY NEXT STEP.

Country workshops discussed challenges in their individual countries regarding the enabling environment both as a basis to answer the questionnaire but also to propose what should be done next. Progress has been made in establishing the basic structure of the enabling environment with policy, laws and plans, but countries are now faced with putting these tools into practice.

Countries identified a lack of implementation mechanisms and instruments to govern and support the management of water resources at subnational levels (El Salvador, Niger, Armenia, Ethiopia). Kazakhstan reports that practical implementation of policies and enforcement is a challenge that stems from resistance to change in the business sector, and results in negative impacts on ecosystems such as the Aral Sea. Malawi and Tanzania identify funding and enforcement of water laws as issues to address moving forward. The IWRM policy of Mauritania is in place and implemented nationwide, but now needs to be followed with capacity development for implementing many aspects, including monitoring and evaluation, integration of gender issues, and mechanisms for citizen participation. Burundi recognizes that while the formulation of policy is important, such policy must be promoted if it is to be adopted across the country; operationalizing water laws and plans requires financial resources which may be lacking.

Roughly one third (37 per cent) of countries are implementing basin or aquifer management plans. Plans are being prepared, or do not exist, in 46 per cent of countries.

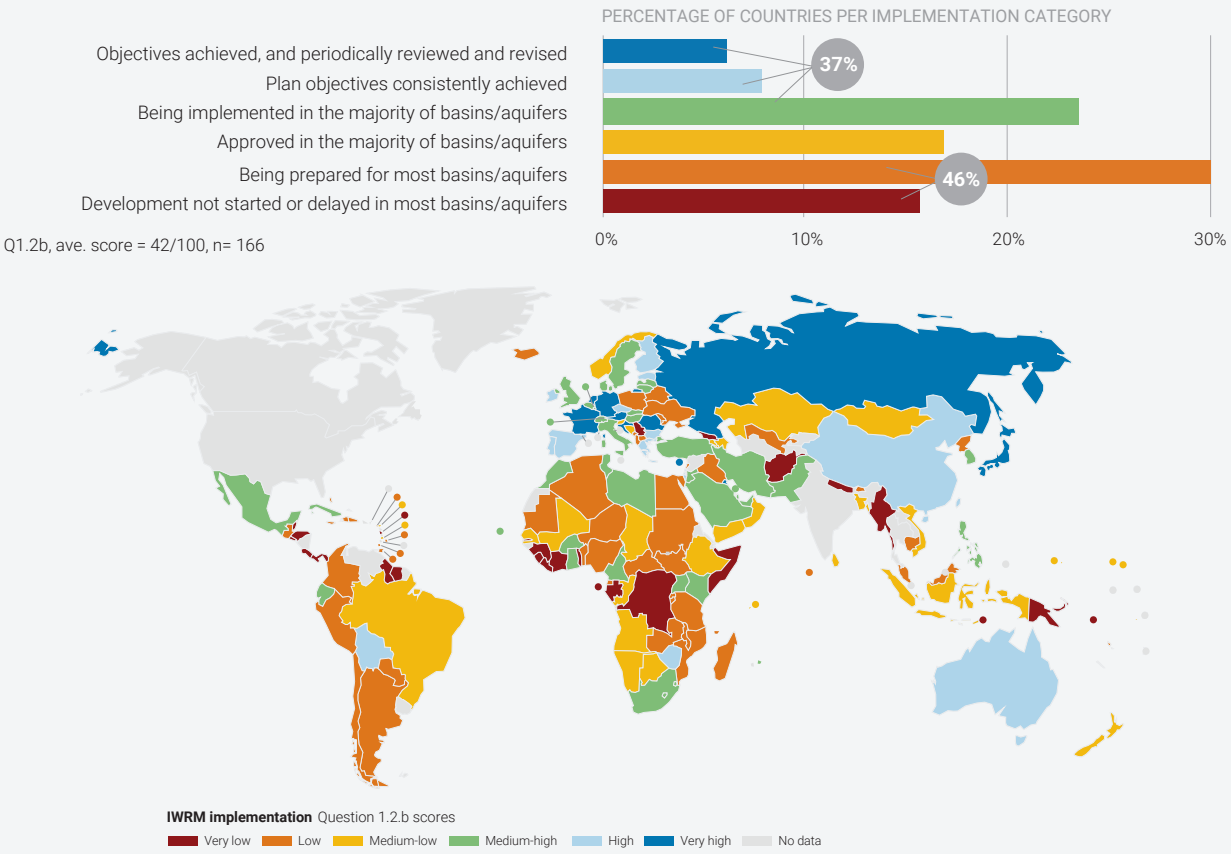

Figure 17 Implementation of basin or aquifer management plans, based on integrated approaches, for the most important basins/aquifers in each country (Q1.2b)

BOX 12

BASIN MANAGEMENT INSTRUMENTS NEED MORE ATTENTION.

Low scores (<50) for water management instruments at basin level are attributed to the absence of some or all key water management instruments, poor geographical coverage, and/or a lack of effectiveness. In Tanzania, nine multisectoral basin water boards carry out water management. Policies and legal instruments are in place, but coverage is limited. Ukraine reports similar experiences, along with poor levels of stakeholder involvement. Other countries report that use of management tools at basin level is limited and takes place only through short-term / ad hoc projects (Togo, Serbia, Sierra Leone, Vanuatu).

In Honduras 61 of 876 watersheds have management plans including the protection of forest areas due to their importance for the conservation of water sources. A sensible and practical strategy may be to first focus on priority catchments to implement water management instruments effectively, and then to scale out from there. However, for practical reasons the questionnaire scoring rewards scale, not quality of management.

The following two examples illustrate the importance of an integrated approach: El Salvador has watershed management instruments with a sectoral focus that cannot be assessed because each institution focuses on the instruments it develops. The water supplier in Seychelles solely manages water resources but only on the basis of human consumption. Currently no management of water for the environment takes place.

Basin management plans are needed to ensure sustainable water security.
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4.3 INSTITUTIONS AND STAKEHOLDERS (SURVEY SECTION 2)

KEY FINDINGS AND RECOMMENDATIONS

1. The vast majority, 83 per cent, of countries report that basin- and aquifer-level organizations exist for their most important basins and aquifers (low implementation and above). **However, the capacity of these organizations needs to increase in 43 per cent of countries to ensure they can effectively lead IWRM implementation (low and medium-low); such organizations need to be established in 17 per cent of countries (very low).**

2. The degree of implementation of private-sector participation in water resources management is fairly evenly spread between the implementation categories:

    - Roughly one third report limited communication between government and business (very low and low implementation).
    - One third report regular consultation and some opportunities for involvement (medium-low and medium-high).
    - One third report regular opportunities for involvement or established and effective mechanisms for private sector involvement (high and very high).

In two thirds of countries, effective private-sector participation needs to significantly increase to help advance sustainable water resources management.

3. The extent to which gender objectives are developed and addressed at national, subnational and transboundary levels is relatively low (global average scores of 32 to 46). However, differences in interpretation of the questions in the national context led to mixed approaches to scoring. Harmonizing responses to these questions will be a significant area for improvement in subsequent surveys, to ensure reliable data are available to support progress on the gender aspect of the Dublin Principles, as well as SDG 5. **Advancing gender objectives in water resources management should be a matter of urgency.**

4. More than 50 per cent of countries report that government authorities at least regularly request information, experiences and opinions of stakeholders in water resources planning and management (medium-high implementation and above). **Attention should focus on the almost half of all countries in which stakeholder participation in water resources management is rather limited at national and local levels (medium-low and below).**

A central element of integrated approaches to water resources management is that water should be managed at a range of levels, from national through to local. Adaptive and effective institutions are typically required at all levels. These institutions need to ensure that planning and decision making involves a participatory approach with the full range of relevant stakeholders.

This section includes: institutions at the national level (Q2.1a), basin/aquifer level (Q2.2a), provincial/state level for federated countries (Q2.2f), and transboundary level (Q2.2e); national-level arrangements for cross-sectoral coordination (Q2.1b) and capacity building (Q2.1f); stakeholder participation at national (Q2.1c) and local levels (Q2.2b); business participation (Q2.2d); and gender considerations at national (Q2.1e), subnational (Q2.2c), and transboundary (Q2.2d) levels.

Globally, average implementation of each of these elements ranges from 63 (both cross-sectoral coordination and national-level public participation) to 33 (gender considerations at the transboundary level. At the country level, scores vary greatly between zero and 100 for most questions, and the distribution of country scores varies between most questions (Figure 18). Most questions are addressed below.

In most countries, authorities exist at relevant levels, and there are opportunities for cross-sector participation from governmental, private-sector, and other stakeholders (medium-low implementation and above).

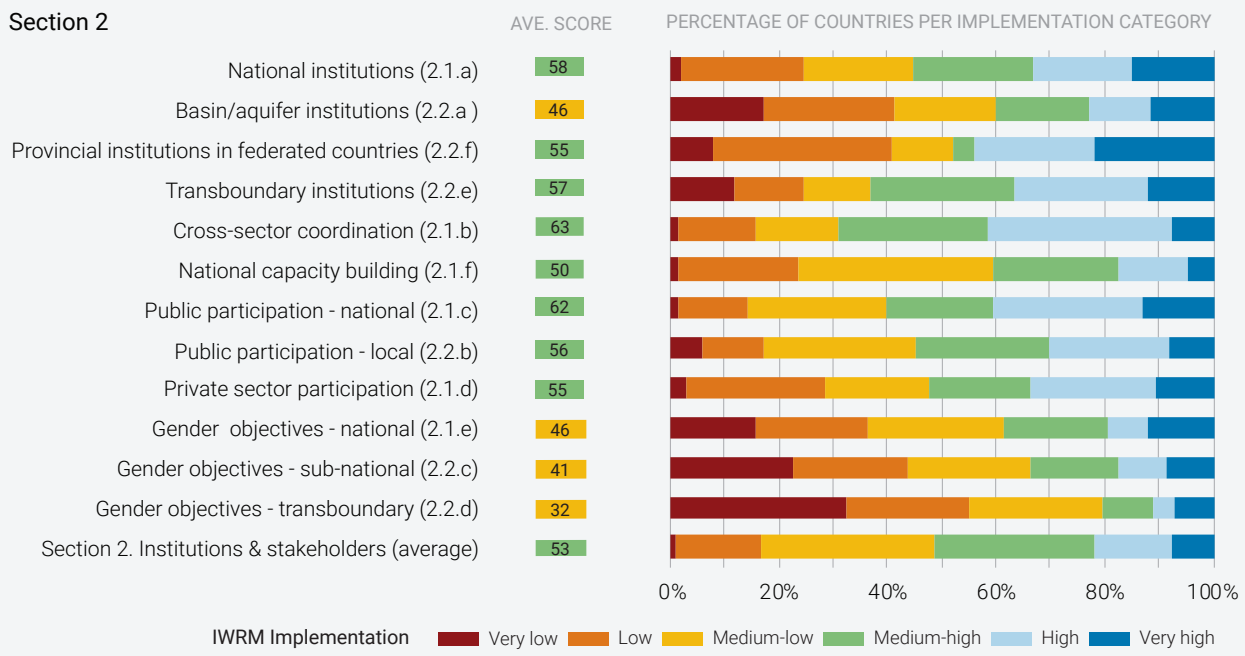

Figure 18 Implementation of institutional arrangements and stakeholder participation

Public authorities that have the capacity to lead IWRM implementation are a cornerstone of water resources management. Authorities could be a ministry or ministries, or other organizations/institutions/agencies/bodies with a mandate and funding from government. Capacity for implementation in this context means that the responsible authorities should be adapted to the complexity of water challenges to be met, and should have the required knowledge, technical facilities and skills, including planning, rule-making, project management, finance, budgeting, data collection and monitoring, risk management and evaluation. Responsible authorities should also have the ability to manage potential conflicts of interest between different sectors and/or stakeholder groups, particularly at the basin/aquifer level, with established coordination procedures in place.

It is encouraging that these two aspects of IWRM implementation – national institutional capacity and cross-sectoral coordination – received two of the highest average global implementation scores (58 and 63, respectively). These scores imply that institutions have the capacity to lead IWRM implementation, and that there are opportunities for different sectors to take part in policy, planning and management processes. Indeed, 41 per cent of countries report that there is formal consultation between different government sectors with the objective of agreeing on collective decisions on important issues and activities (high and very high implementation) (Figure 29, Chapter 5). On the other hand, capacity development initiatives are reported as rather less advanced (50), implying that countries, on average, report that some long-term capacity development initiatives are being implemented, but that geographic and stakeholder coverage is limited. With long-term progression and sustainability of water resources management in mind, this offers a clear area for improvement in many countries (Box 26, Chapter 6).

While national institutional capacity is important, a key principle of IWRM is that water resources also need to be managed according to hydrological boundaries, not administrative boundaries. More than three quarters of countries report having basin- or aquifer-level institutions in place, though the capacity of these institutions varies significantly between countries (Figure 19 and Box 13).

The vast majority (83 per cent) of countries report that basin- and aquifer-level organizations exist for their most important basins and aquifers (low implementation and above). However, only 40 per cent of countries report that the organizations have the capacity to effectively lead IWRM plan implementation (medium-high and above).

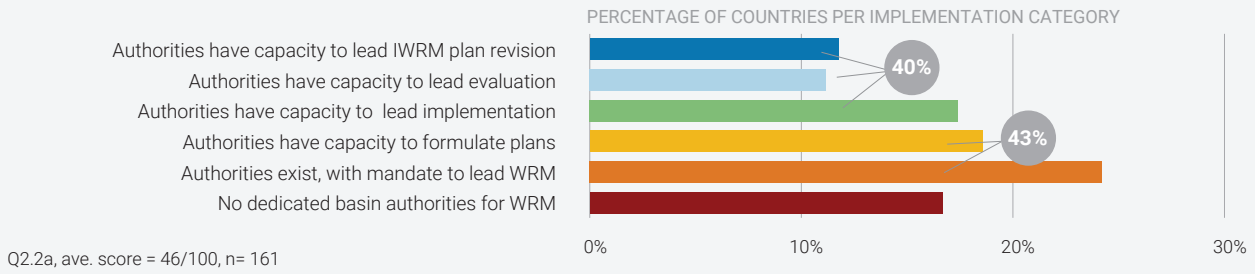

Figure 19 Existence and capacity of basin- or aquifer-level organizations for leading implementation of IWRM plans or similar (Q2.2a)

BOX 13

BASIN ORGANIZATIONS EXIST BUT OFTEN LACK CAPACITY AND FINANCE TO IMPLEMENT IWRM PLANS.

Many countries have water management structures at the basin or aquifer level. Though established under widely different circumstances, these structures nonetheless confront similar challenges. In Argentina, basin authorities have the capacity to lead IWRM plan formulation, but they do not have full capacity to effectively lead periodic monitoring and evaluation. Similar reports identify a crucial need to enhance the personnel (numbers, qualifications, or pay) (Bulgaria, Hungary, Armenia, Guatemala, Ethiopia) to be able to plan and implement IWRM, to carry out basic water management functions, or to be able to extend across the full geographic area.

Honduras sums up the problems of many countries that are trying to implement basin management of water resources: "Even though the establishment of Basin Organizations is considered at legislation level (basin councils, sub-basin and micro-basins), the existing organizations require strengthening and lack financial support. There are management plans at basin level, but these are mostly not implemented, the plans are realized mainly under the guidance of cooperation projects and others, but once they have been implemented, the sustainability of the Basin Organizations is hindered due to difficulties in their financial and technical sustainability."

Nevertheless, countries scoring over 80 can be found in all regions (Kenya, Burkina Faso, Lesotho, Brazil, Lebanon, Libya, Italy, Latvia, China, Morocco, Netherlands, Tuvalu, Russia, Australia), and can provide a learning experience for others. In Burkina Faso, each water management area has its own water agency, which develops an annual action programme for implementing IWRM actions. Burundi, Ethiopia and Cambodia are implementing in pilot areas or selected basins. This piloting approach is one strategy that countries struggling with capacity constraints could adopt.

While cross-sectoral coordination in this context addresses government stakeholder participation, effective water resources management requires wider stakeholder participation, including all interested parties who are, or may be, affected by any water resources issue or intervention. Stakeholders include the private sector, organizations, institutions, academia, civil society and individuals. Beyond water resources management, Agenda 2030 stresses the importance of establishing partnerships, which require public participation, and creating synergies with the business sector.

Six questions address stakeholder participation and gender aspects (Figure 18, from "public participation – national" to "gender objectives – transboundary").

About a third (34 per cent) of countries report that there are established mechanisms for regular private-sector participation in water resources development, management and use (Figure 20 and Box 14). Encouragingly, another 38 per cent of countries report conducting regular consultation or at least having some established mechanisms for private-sector participation.

At least regular consultation between government and business about water resources development, management and use takes place in 73 per cent of countries.

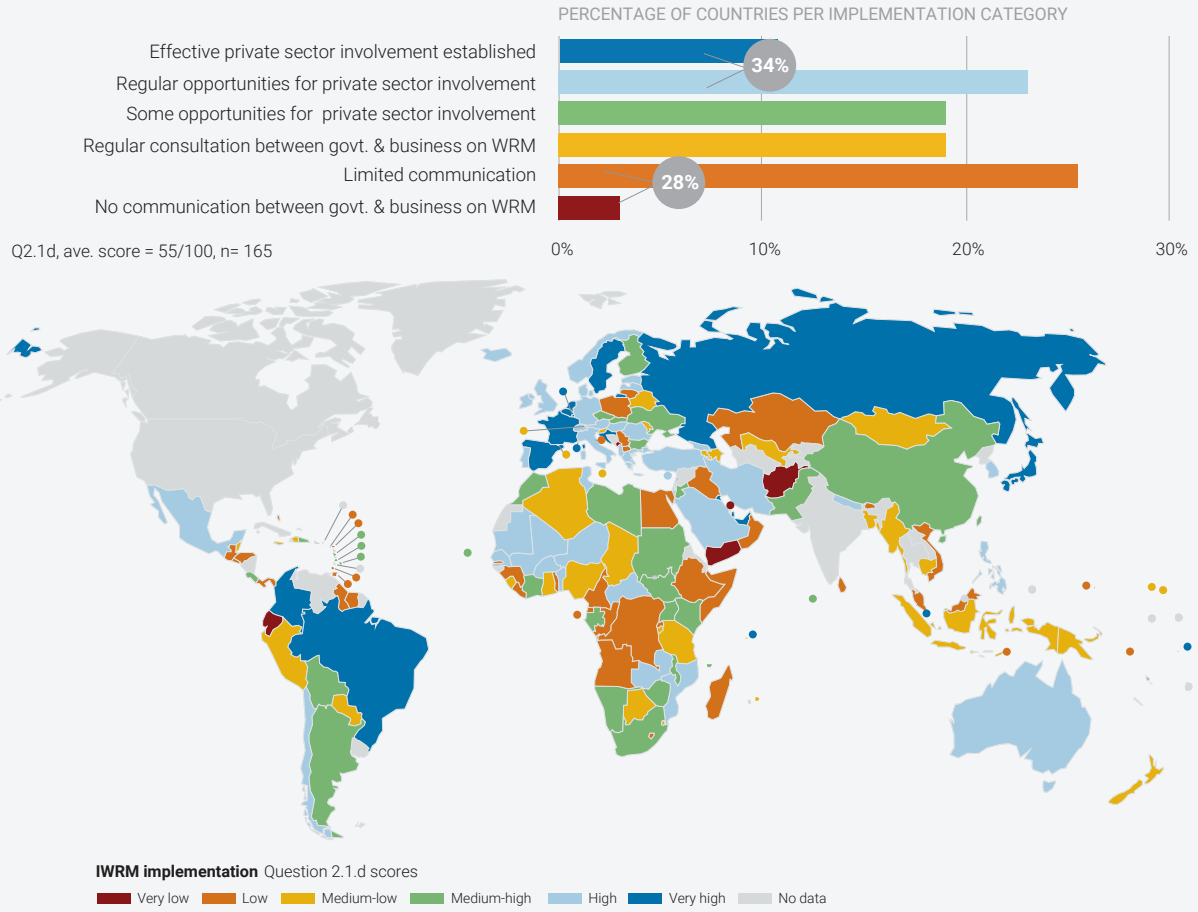

Figure 20 Private-sector participation in water resources development, management and use (Q2.1d)

Private-sector involvement can include situations in which the regulatory environment allows for private-sector service provision, such as for water supply and sanitation services. Private-sector engagement can help to identify regulatory gaps and weaknesses in the enabling environment. Private-sector participation can thus can help countries reform for broader water improvements, strengthen participation that incorporates the range of water uses and users, and encourage learning across public- and private-sector domains (Box 14). The private sector may also provide new information, technologies, and investment opportunities to improve water management and use, thereby supporting activities to deliver targets under SDG 12 on sustainable consumption and production.

For stakeholders other than the private sector, implementation appears to be slightly more advanced at both the national level (global average of 63) and the local level (global average of 57). At both these levels, more than 50 per cent of countries report that government authorities at least regularly request information, experiences and opinions of stakeholders in water resources planning and management (medium-high implementation and above) (Box 15).

Disaggregated data from SDG indicator 6.b.1 measures the extent to which communities participate in water resources planning and management. This indicator compares to question 2.2b from the 6.5.1 survey.[29] Of the 61 countries that participated in both questionnaires, 43 per cent report consistent levels of local level participation, and 44 per cent report "adjacent" levels of participation, indicating a reasonable match between the two datasets.[30] Harmonization of these indicators continues to be refined by custodian agencies in collaboration with countries.

[29] World Health Organization (WHO) (2017). *UN-Water global analysis and assessment of sanitation and drinking-water (GLAAS)*. See question A.10j from the 2016-17 GLAAS questionnaire.

[30] Note that the 6.5.1 survey responses are official government responses, which may reflect stakeholder perspectives to varying extents, whereas the 6.b.1 data are derived from local-level surveys.

BOX 14

PRIVATE-SECTOR ENGAGEMENT TYPICALLY ADVANCES IWRM IMPLEMENTATION.

Countries with higher levels of water resources management are more likely to have strong engagement with the private sector (Kuwait, UK, United Arab Emirates, Saudi Arabia, Sweden, Singapore). Across the European Union, the private sector has become closely involved in supporting countries in the implementation of the Water Framework Directive. In only one case is private-sector engagement in the water sector identified as forbidden by law (Uzbekistan).

At the basic level, governments consult the private sector as a stakeholder/consumer in the water management decision structures at national and regional/basin levels, and as a contractor for construction projects (Trinidad and Tobago, Uganda, Turkey). In more advanced stages the private sector engages as partners in implementation, or they contribute financial support to water management. Zambia reports private-sector activities regarding catchment protection, private irrigation dams, and mining and water quality. In Nepal and Tanzania, the private sector engages in hydropower development and service delivery. The private sector runs water supply and sanitation services in many countries (Malaysia, Malawi, Lebanon).

Only a few countries identify specific financing measures with engagement of the private sector. The Dominican Republic has enabled the implementation of pilot initiatives on Payment for Environmental Services (PES), which support the establishment of a national system of compensation and payment for environmental services. This system is intended to contribute to the conservation of natural resources and to the reduction of poverty levels of rural communities.

BOX 15

PUBLIC PARTICIPATION LEADS TO MORE SUSTAINABLE AND EFFECTIVE OUTCOMES.

Formal, ongoing mechanisms are in place for stakeholder engagement in countries such as Burkina Faso, Botswana, Guyana, Lebanon, Maldives, Singapore, Uganda, Trinidad and Tobago, and Uzbekistan. In Uzbekistan, law stipulates that public authorities "may consider" proposals from the Association of Water Users, other NGOs, and citizens. This wording provides an incentive for NGOs to clearly define problems and suggested solutions so that their proposals will be considered and adopted by public authorities. The Maldives formulated a national strategy and five-year (2017-2021) campaign to promote awareness about and increase public participation in water and sewerage issues. The key objective of the campaign is to enable the public to become more knowledgeable about, responsible for, and involved in water resources, water supply and sewerage systems management.

Developing and implementing gender objectives in water resources management as called for in the Dublin Principles[31] not only enhances gender equality and empowerment, but can also support effectiveness and efficiency in projects, environmental sustainability, and more accurate analyses of water use.[32] Establishing and implementing gender objectives also support SDG 5 on gender equality. National and subnational implementation of gender objectives for water resources management have global averages of 46 and 41, respectively, equivalent to medium-low implementation (Figure 21, Box 16). Gender objectives at the transboundary level received the lowest average of all questions (32).

The level of confidence in these results is relatively low.

[31] International Conference on Water and the Environment (1992). *The Dublin statement on water and sustainable development.* Dublin, Ireland.

[32] UNDP (2006). *Resource guide: mainstreaming gender in water management*. http://www.undp.org/content/undp/en/home/librarypage/environment-energy/water_governance/resource-guide-mainstreaming-gender-in-water-management.html. Accessed 26 July 2018.

Many countries report in different ways on these questions: responses could have been zero, 100, or "not applicable" if countries consider gender objectives to be addressed by national constitutional arrangements rather than by provisions at the level of the water resources sector, or if national arrangements also apply at subnational levels. Furthermore, a significant proportion of countries respond "not applicable" (n/a) to the gender questions at national (13 per cent), subnational (27 per cent) and transboundary (44 per cent) levels, respectively. At the national level, the main reasons given by countries for responding "n/a" are that gender equity is addressed through other national laws and policies, which therefore include the water sector. The increase in "n/a" responses at the subnational level is mainly explained by the fact that national laws or policies apply at all levels, and by the tendency of very small countries to respond "n/a" to many subnational questions. Harmonizing the way countries understand and respond to these questions will be a major area for improvement in subsequent surveys. Countries need to ensure that water resources management and programmes incorporate their gender objectives.

Subnational laws, policies or plans in 44 per cent of countries include gender objectives, but with limited or no funding or implementation. Gender objectives are not explicitly addressed in 23 per cent of countries.

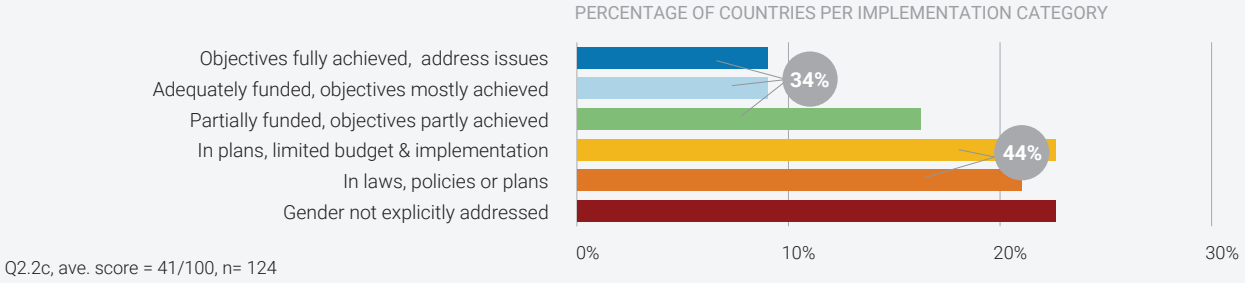

Figure 21 Gender-specific objectives in laws, policies or plans at subnational levels (Q2.2c)

BOX 16

COUNTRIES PROVIDE EXAMPLES OF IMPROVEMENTS TAKING PLACE IN GENDER PARITY IN POSITIONS OF AUTHORITY AT DIFFERENT LEVELS.

The proportion of women in decision-making roles is increasing. In Algeria, the number of female staff in the provincial water resources directorates grew from 26 per cent in 2009 to 37 per cent in 2016. In Australia, the proportion of women on Queensland government boards grew from 31 per cent to 39 percent over a two-year period. Management structures take gender into account in many countries (Burkina Faso, Azerbaijan, Zambia). Tanzania requires that at least one third of the representatives serving on its basin water boards are female. Jamaica reports that its water board has a female-to-male ratio of 5 to 4. Niger has a law, rigorously enforced, prescribing the gender quota in elective bodies and at administrative levels.

Many countries, including Armenia and Uzbekistan, state that while policy prohibits gender discrimination, the share of women in decision-making roles of management bodies nonetheless remains very small. They suggest that steps should be taken to enhance the role of women and to improve working conditions in the water sector. Even where gender strategies are in place some countries identify limited progress (El Salvador, Ghana, Guatemala) due to limited budget and implementation.

Social norms hinder policy reform in some countries, such as Egypt, where women often have less access to and fewer rights over natural resources because of customs, traditional roles, and land-titling and inheritance laws and practices that favour men.

4.4 MANAGEMENT INSTRUMENTS (SURVEY SECTION 3)

KEY FINDINGS AND RECOMMENDATIONS

1. For most questions, a significant proportion of countries (20-30 per cent) report very low or low implementation. In these countries, the respective management instruments are either not being implemented, or they are ad hoc, short-term, or project-based, rather than long-term initiatives. **In these cases, management instruments need to either be established, or transformed from short-term projects to long-term programmes. These actions will require innovative and sustainable financing.**

2. In all, 73 countries (45 per cent) report that they have no aquifer management instruments, or that they rely on limited, short-term projects. **Sustainable aquifer management programmes need to be established and financed as a matter of priority, particularly in countries with significant groundwater use.**

3. Management instruments for sustainable water use, pollution control, ecosystem management, and disaster risk reduction are not being sufficiently implemented to support other SDG targets. In these areas, more than half (50-60 per cent) of countries report that they have no instruments in place (very low), or that they are limited to short-term projects (low), or that stakeholder or geographic coverage is limited (medium-low). **Long-term programmes need to be established and expanded to support countries to achieve targets on water efficiency and sustainable withdrawals (target 6.4), good ambient water quality (target 6.3), freshwater ecosystem management (target 6.6), and water-related disasters (target 11.5).**

Management instruments refer to the tools and activities that provide information that enable stakeholders to make rational and informed choices for water management, and that provide the framework to implement management activities.

This section includes (question numbers in brackets): national water availability monitoring (3.1a), management programmes and tools for sustainable and efficient water-use management (3.1b), pollution control (3.1c), water-related ecosystems (3.1d), and reduction of the impact of water-related disasters (3.1e), basin management instruments (3.2a), aquifer management instruments (3.2b), data and information sharing within countries (3.2c), and transboundary data and information sharing between countries (3.2d).

The global average and distribution of results in this section are relatively similar for each question, with averages ranging from 58 (national water-availability monitoring) down to 42 (implementation of aquifer management instruments) (Figure 22). For most questions, a significant proportion of countries (20-30 per cent) report very low or low implementation. In these countries, either the respective management instruments are not being implemented, or they rely on ad hoc, short-term, or project-based measures, rather than long-term initiatives.

As is the case in other sections, the pattern for each Human Development Index (HDI) group is similar for each question, with the very high HDI countries reporting significantly higher degrees of implementation (generally 30-40 points higher for each question) compared to the countries in the other three HDI groups (generally 30-40 points higher for each question).[33]

Aquifers are increasingly recognized as critically important for sustainable development, often with implications for the poor. At the same time, they are too often poorly understood and used unsustainably.[34] Only eight countries report aquifer management instruments as "not applicable" (Q3.2b). Of the remaining 162 countries, 45 per cent report either having no aquifer management instruments in place, or relying on short-term or ad hoc projects (Figure 23). Another 19 per cent of countries report effective or highly effective outcomes from their aquifer management programmes, with very good or excellent geographic and stakeholder coverage (Box 17). Most countries in Latin America report limited use of aquifer management instruments, and generally only through short-term, ad hoc projects (low implementation). The status in Africa and other regions is more mixed. There is an urgent need to ensure that surface water and groundwater are managed in an integrated manner.

The implementation of management instruments for river or lake basins is somewhat more advanced, with only 26 per cent of countries reporting either that basin instruments don't exist, or instruments are limited to short-term projects. Still, as per aquifer management, only 20 per cent of countries reported effective or highly effective outcomes from basin management

[33] Data not shown.

[34] Smith, M., Cross, K., Paden, M. and Laban, P. (2016). *Spring: managing groundwater sustainably.* Gland, Switzerland: International Union for Conservation of Nature.

For most management instruments, 20-30 per cent of countries report either that none exist, or that management instruments occur in short-term projects rather than via ongoing initiatives (very low or low implementation).

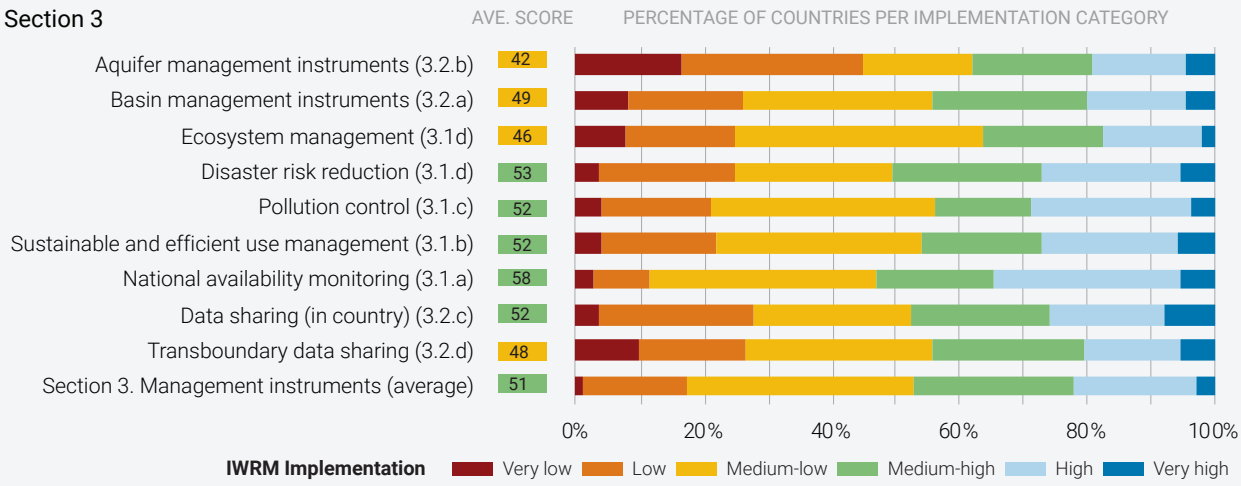

Figure 22 Implementation of management instruments

Almost half of reporting countries (73 countries) either have no aquifer management instruments, or are limited to short-term projects.

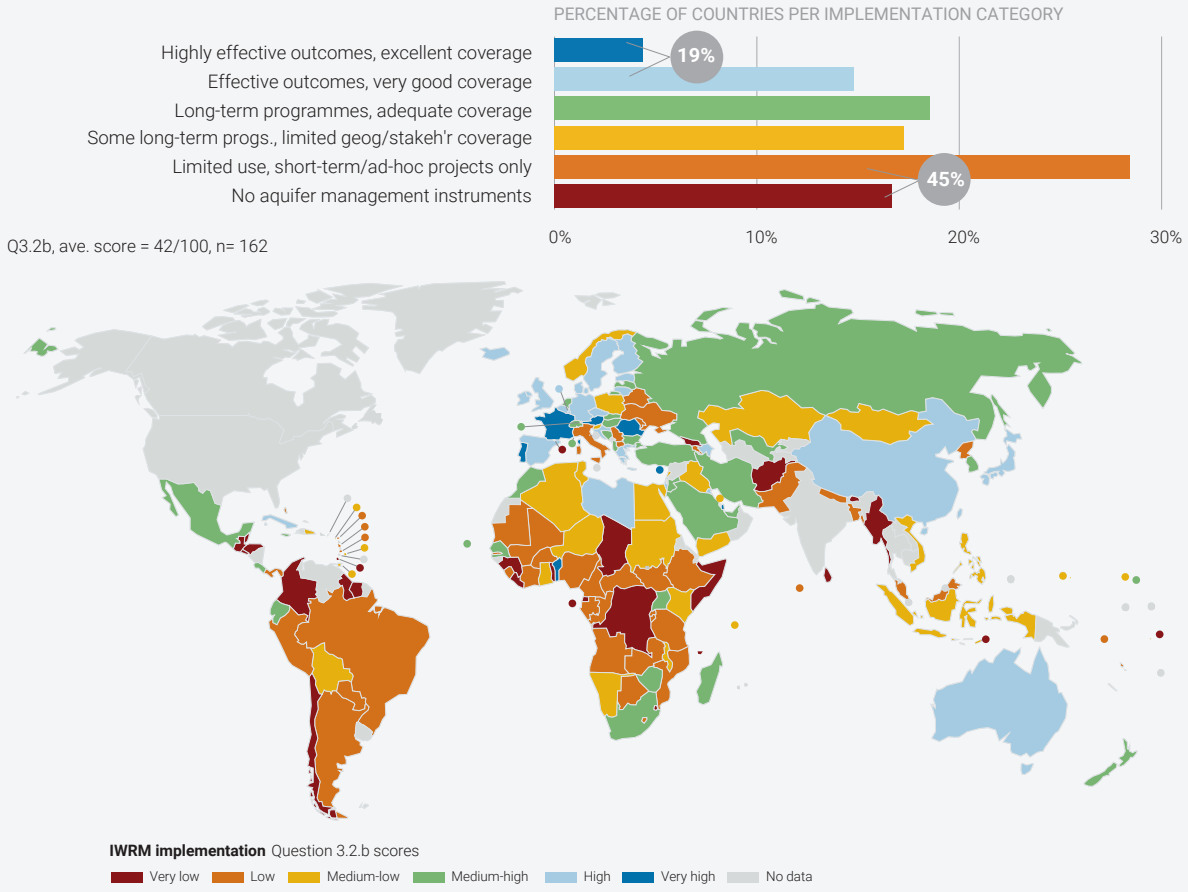

Figure 23 Implementation of aquifer management instruments (Q3.2b)

programmes with very good or excellent coverage (Box 12, Section 4.2).

Sustainable and efficient water use and monitoring of water availability is critical to achieving Goal 6, as expressed through Target 6.4: "By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity."

Future reporting would benefit from coordinating reporting and analysis of SDG indicators 6.4.1(efficiency) and 6.4.2 (water stress)[35] with related questions in the 6.5.1 survey, particularly 3.1a (monitoring) and 3.1b (sustainable and efficient water-use management instruments).

Pollution-control programmes include regulations, water quality guidelines, economic tools (e.g. taxes and fees), water-quality trading programmes, water-quality monitoring, education, consideration of point and non-point (e.g. agricultural) pollution

Half (50 per cent) of countries report implementing some management instruments for sustainable and efficient water use either through short-term projects or through more long-term programmes that have limited coverage across water users and the country (medium-low and low). Efforts need to focus on converting projects into more long-term initiatives, and prioritizing uptake across users and areas of countries.

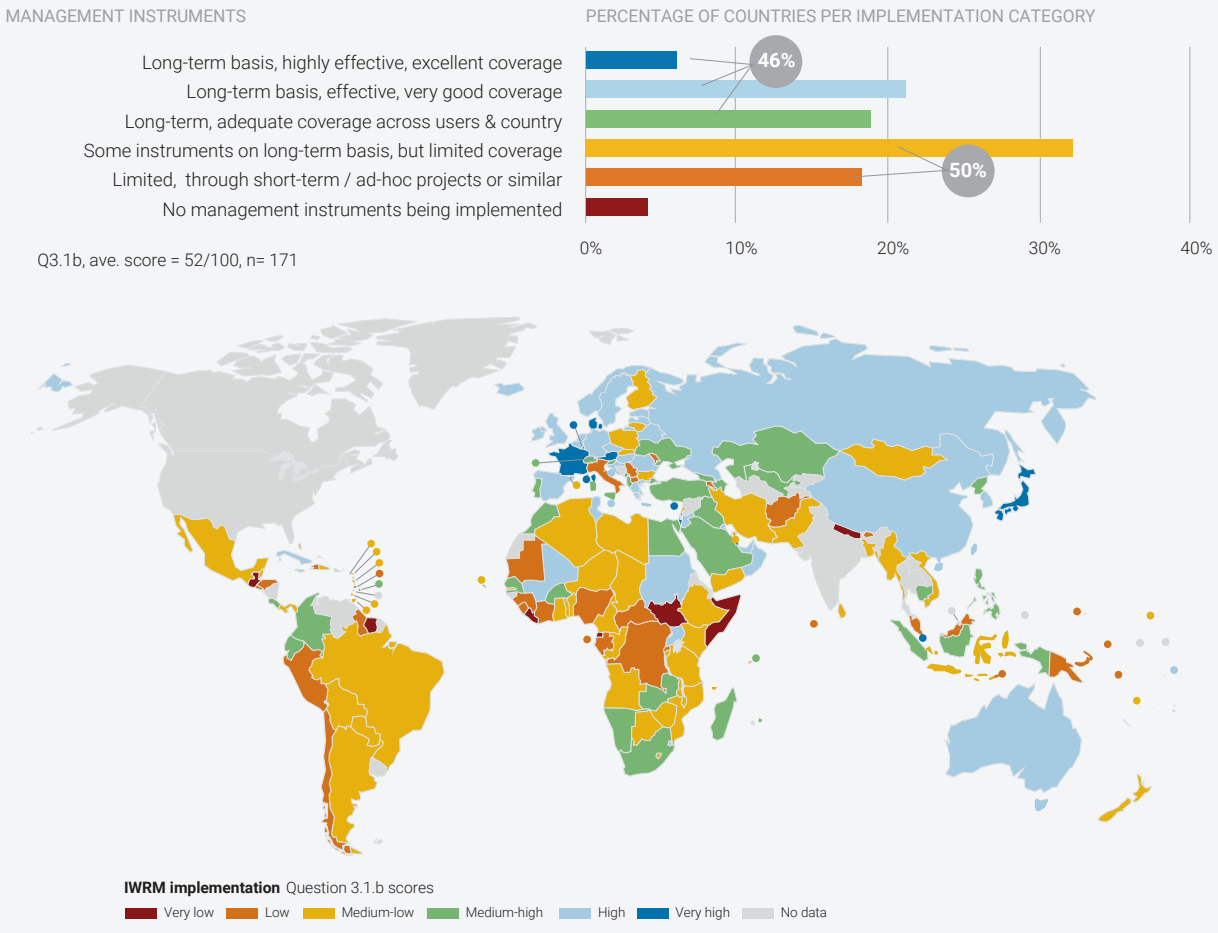

Figure 24 Implementation of management instruments for sustainable and efficient water use from the national level (includes surface and/or groundwater, as relevant to the country) (Q3.1b)

[35] See indicator reports for SDGs 6.4.1 and 6.4.2:
The Food and Agriculture Organization of the United Nations (FAO) and UN-Water (2018). *Progress on water use efficiency. Global baseline for SDG6 Indicator 6.4.1: Change in water use efficiency over time.*
FAO and UN-Water (2018). *Progress on level of water stress. Global baseline for SDG 6 Indicator 6.4.2: Level of water stress: freshwater withdrawal as a proportion of available freshwater resources.*

BOX 17

EFFECTIVE AQUIFER MANAGEMENT IS ESSENTIAL FOR SUSTAINABLE DEVELOPMENT IN MANY REGIONS.

Groundwater is an important source of drinking and irrigation water, especially for small islands and countries with low, or very seasonal, rainfall. Aquifers at risk of over-exploitation or pollution, and those shared between two or more countries attract the highest management attention. For example, Mexico has defined 653 aquifers that serve as the primary source of water for its rural population, for irrigation of approximately 2 million hectares of agricultural land, and for cities with a combined population of roughly 60 million. Though 80 per cent of these aquifers have good quality water, 40 aquifers are degraded due to human activities or natural causes. Kuwait, Libya, the United Arab Emirates, and Saudi Arabia are implementing aquifer management plans and monitoring programs in most aquifers. Australia has commenced development of a new Great Artesian Basin Strategic Management Plan within which state and territory governments coordinate the management of basin resources.

At the transboundary level, Algeria and Tunisia positively describe the cooperation on the management of the North Sahara Aquifer system that has been operational since 2008. The consultation mechanism contributed to the improvement of knowledge and technical collaboration, the emergence of shared basin awareness, and the transition to political cooperation between the three countries that share the aquifer (Tunisia-Libya-Algeria). Since the 1990s, Argentina, Brazil, Paraguay and Uruguay have engaged in many cooperative initiatives under the Agreement on the Guarani Aquifer.

In some cases, basin management plans encompass aquifer management (Slovakia, Turkey, Trinidad and Tobago). Other countries identify a lack of any aquifer management plans (Malaysia, Guatemala). Belize notes the lack of any scientific data from which to develop management plans for aquifers.

BOX 18

MANY PROVEN WATER-USE EFFICIENCY MECHANISMS ARE IN PLACE AROUND THE WORLD.

Water allocation permits, tariff systems for water supply and sanitation, and education programmes are the most commonly reported tools for promoting water use efficiency (Kenya, Namibia, Hungary, Greece, Lesotho, Ghana, Jamaica, Marshall Islands). However, some countries report challenges with these same tools. Lesotho reports difficulties with monitoring adherence to permits. Kenya reports low levels of public awareness about efficient water use, though permit systems are in place.

Uganda reports that effective and efficient water-use management in the form of water permits for surface and groundwater use has been ongoing since 1999, with very good coverage across the country and among different water users. Botswana is starting a national water accounting exercise to assess the efficiency of water use by different sectors of economy. Malaysia, with low tariffs, low awareness levels and low irrigation efficiency, is focusing action in key river basins. New Zealand is aiming to adjust the national policy framework to address over-allocation, and to provide a more efficient water allocation framework.

Australia reports large investments aimed at increasing water-use efficiency in the Murray-Darling Basin. Over 2,000 projects help farmers improve their on-farm water-use efficiency, and large-scale improvements benefit more than 10,000 individual irrigators. For households, legislation requires showers, taps, toilets, urinals, clothes washing machines, dishwashers and flow controllers sold in Australia to carry a water efficiency rating and consumption details so purchasers can make informed decisions. Estimates suggest that these measures have reduced total household water consumption by 8 per cent.

However, many countries report that they have no programmes to promote efficient water use (Guatemala, Liberia, Nepal, Suriname, Myanmar). Iceland, with abundant supplies of fresh water, may question whether the benefits of achieving more efficient use is worth the cost. Latvia, while noting that it has no real need to restrict water demand, uses pricing of water services to restrict use.

Countries in all regions report effective systems in place to improve water use efficiency. Their experiences present opportunities to share benefits and strategies to boost action in nearby countries.

sources, construction and operation of wastewater treatment plants, and watershed management. Encouragingly, 36 per cent of countries report that some pollution-management instruments are being implemented on a more long-term basis, even if these programmes or instruments still need to be rolled out to include more sectors and a greater proportion of the country (medium-low) (data shown in Annex B, Q3.1c) (Box 19). Roughly a quarter (24 per cent) of countries report that pollution-management instruments are effective, and are implemented on a long-term basis, with very good coverage across sectors and the country.

Many pollution-management instruments are likely to overlap with ecosystem-management instruments, which can include tools such as management plans, the assessment of Environmental Water Requirements (EWR), and protection of areas and species. Monitoring includes measuring the extent and quality of the ecosystems over time. Ecosystem-management instruments lag pollution-control instruments (global average score of 45 compared to 51). Still, 41 per cent of countries report that some ecosystem-management instruments are being implemented on a more long-term basis, though with limited coverage across different ecosystem types and the country (data shown in Annex B, Q3.1d) (Box 20).

For both pollution control and ecosystem management, more than 70 per cent of countries are implementing at least some instruments on a more long-term basis (medium-low and above). This means that there is some capacity to implement these instruments. The challenge lies in scaling up implementation to achieve better coverage across the country.

Both of pollution control and ecosystem management support targets 6.3 (improve water quality by reducing pollution) and 6.6 (protect and restore water-related ecosystems). In future reporting, it would be helpful to coordinate reporting and analysis of SDG indicators 6.3.2 (ambient water quality) 6.6.1 (ecosystem extent)[36] with related questions in the 6.5.1 survey, particularly on pollution control (3.1d) and ecosystem management (3.1e).

For a discussion on Disaster Risk Reduction, see Chapter 5.

BOX 19

POLLUTION MANAGEMENT INSTRUMENTS NEED TO BE MORE EFFECTIVE.

One of the more challenging aspects of water resources management is pollution management, which usually involves licensing, monitoring and legal enforcement based upon laboratory testing able to withstand legal scrutiny. Most European countries report scores of 80 or higher, but low scores are the norm in other regions. In African countries, pollution systems remain in a developmental stage. Exceptions are: Botswana and Uganda (both at 80), Mali and Tunisia (at 70), and Madagascar (60). Laws and standards may be in place but with limited geographical application and effectiveness. Latin America and the Caribbean report more pollution control systems in place and some high- performing countries (Jamaica and Cuba (at 80), Ecuador (70) and Mexico (60)), but some large countries in the region have low scores (Argentina (30), Brazil (40)). A similar situation exists in Asia.

As mentioned by Costa Rica (30) the presence of many legal, technical and economic instruments with adequate coverage does not assure successful pollution control. Pollution management usually lies within the mandate of the environment agency, but coordination is a challenge. In Argentina, pollution control lies with the provinces, and, thus, providing a national scenario is difficult.

In Botswana (80) the Ministry of Environment, Natural Resources Conservation and Tourism is mandated to prevent environmental pollution through the Waste Management Act. However, the Department of Water Affairs also monitors pollution to protect the water resources through the Water Act, and the Ministry of Health and Wellness also monitors pollution through the Public Health Act to prevent water-borne diseases.

In summary, much more work remains to be done to translate the presence of pollution- management instruments into effective tools for the sustainable management of water resources.

[36] See indicator reports for SDG 6.3.2 and 6.6.1:
UN Environment (2018). *Progress on monitoring ambient water quality: piloting the monitoring methodology and initial findings for SDG 6 Indicator 6.3.2.*
UN Environment (2018). *Progress on monitoring water-related ecosystems: piloting the monitoring methodology and initial findings for SDG 6 Indicator 6.6.1.*

BOX 20

SOME ECOSYSTEM MANAGEMENT TAKES PLACE, BUT NATIONAL REGULATIONS ARE OFTEN NOT UP TO THE TASK.

Few countries refer to environmental management laws, and many refer only to wetlands or water- quality monitoring in assigning their scores. In Argentina and Malaysia, the use of water ecosystems- management instruments at the provincial level is limited to short-term or special projects.

However, laws and regulations are in place in some countries. In Bhutan, forest and nature conservation rules require maintaining a minimum of 60 per cent forest coverage, and prohibit the destruction of wetlands. Costa Rica protects wild areas related to water. China allocates water for environmental use. The EU Water Framework Directive provides a legal framework to protect and improve the status of water-related ecosystems, and has been incorporated into national legislation in many countries (Cyprus, Norway, Slovakia). Dominica has environmental health and land use policies and legislation, and has designated national parks, forest reserves and protected forests.

Biodiversity protection has expanded and intensified in the Philippines, one of the world's 17 megadiverse countries, containing 70 percent of the world's plants and animal species. In Uganda, some ecosystem management takes place through catchment-management plans on a short-term basis, but coverage is limited across different ecosystem types and areas in the country.

The Sustainable Development Strategy of Latvia has a defined priority of long-term action for "management of natural capital". This approach provides for sustainable management of natural resources, the development of ecosystems services, and the reduction of pollution and waste flows. The focus of the 2018 World Water Development Report on nature-based solutions suggests that the link between water resources management and ecosystems deserves more attention.

Pollution management instruments need to be more effective.
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Data availability and sharing across relevant stakeholders are a prerequisite to sustainable and equitable water resources management.

Nearly half (49 per cent) of countries report short-term or limited coverage of data and information sharing across users and parts of the country (low and medium-low). Focus should be given to making more long-term arrangements, and to increasing coverage.

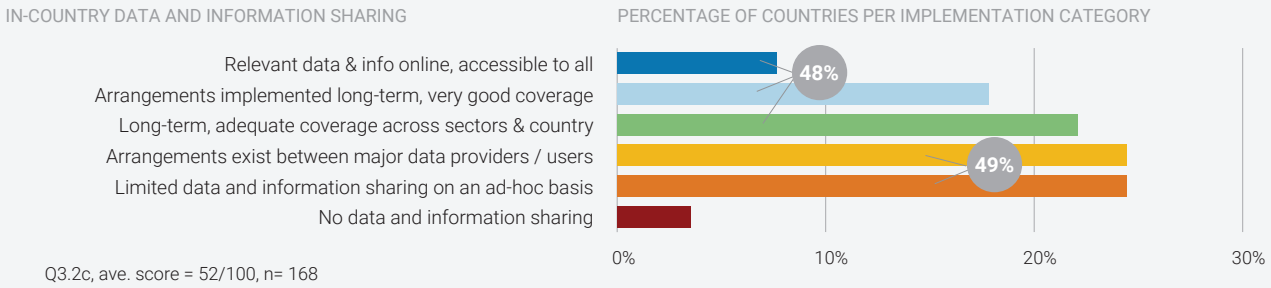

Figure 25 Implementation of data and information sharing within countries at all levels (Q3.2c)

BOX 21

THE NEED FOR DATA SHARING IS WIDELY ACCEPTED, BUT MANY BARRIERS IMPEDE OPEN AND EFFECTIVE ACCESS.

The large majority of respondents confirmed that they collect data on water, and that they share at least some data with other national agencies and the public. However, the nature of the data (e.g. whether it addresses quantity, quality, allocation, compliance, and/or groundwater/ surface water) is not identified in the survey. Moreover, coverage, quality and formats vary widely. About 20 per cent of countries add some caveat to their response on data sharing.

Zimbabwe reports that accessing data can entail complex and expensive procedures. The Philippines provides data only upon request. Panama provides data only to state institutions. Uzbekistan and Malaysia report that they may require payment for provision of data. Solomon Islands and Serbia do not regulate data and information sharing. Many countries determine data access on an ad hoc basis (Sierra Leone, St Kitts and Nevis, Guinea, Guatemala, Ethiopia).

Confidence in the quality of data is essential for good water management (e.g. for investment decisions, allocation or prosecution of polluters). The integrated approach may also suffer if stakeholders mistrust the data provided (Armenia). A lack of information to accurately assess progress hampered the completion of the questionnaire (Ukraine).

In addition, progress is needed in countries that report suboptimal data-management systems (Togo, Tonga, Kazakhstan), incompatible formats (Malaysia), or a lack of up-to-date information (Tanzania).

4.5 FINANCING (SURVEY SECTION 4)

Effective water resources management requires financing for both initial investments and ongoing costs. Investments for water resources development and management. These include both more traditional "hard/grey" projects such as infrastructure for water supply (e.g. dams, pipes and pumps), and flood management (levees and dykes) infrastructure; and "soft/green" projects such as restored or constructed wetlands for water supply, water treatment, and flood management; investments in land-management practices for water resources; and nature-based solutions, among them, the reconnecting of rivers with their floodplains. Financing is also required for investments, and ongoing costs, in institutions and people to raise capacity across the board.

These aspects are captured through questions in this section on: national and subnational budgets for investments in water resources management, including infrastructure (Q.4.1a and 4.2a); national budgets for the recurring costs of IWRM (Q4.1b) and subnational- or basin-level revenue raising for IWRM elements (Q.4.2b); and financing for transboundary cooperation (Q.4.2c) (Figure 26).[37]

KEY FINDINGS AND RECOMMENDATIONS

1. A staggering three quarters of countries report insufficient funds reaching the planned investments for water resources management at national and subnational levels (72 and 79 per cent of countries, respectively). **Financing must significantly increase in these countries. Otherwise Target 6.5 and most of the targets under Goal 6 are not likely to be met.**

2. Two thirds (66 per cent) of countries report either that revenue is not raised at basin, aquifer or subnational levels, or that limited revenue is raised but not spent on IWRM activities. **Revenue raising for water resources management warrants urgent attention.**

3. **Investments must be secured, allocated and mobilized so that institutions, the enabling environment and management instruments can deliver sustainable, efficient, and equitable water management.**

Approximately 70 per cent of countries report medium-low implementation or below across different aspects of financing.

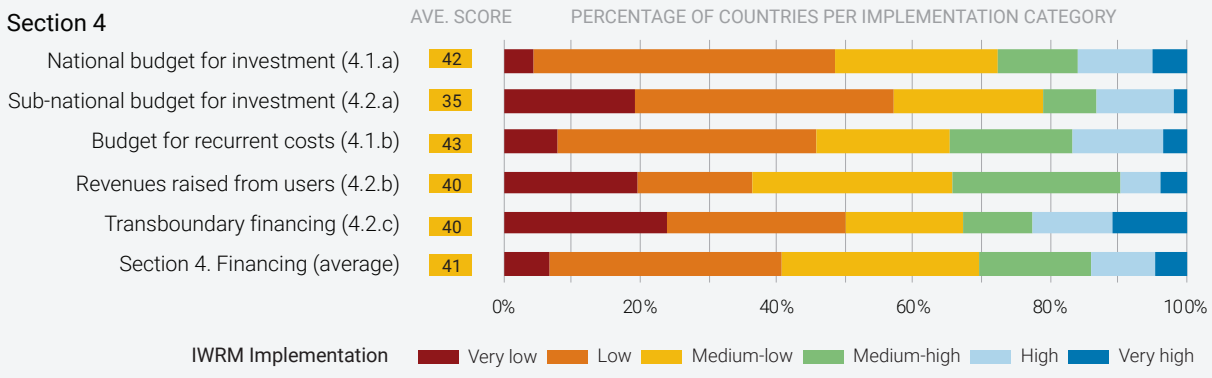

Figure 26 Implementation of financing for water resources management

[37] Note that reporting on Indicator 6.5.1 includes investments covering all aspects of water resources development and management, but excludes any related to drinking water supply and sanitation services, which are reported under indicators 6.1.1 and 6.2.1. Further harmonization and cross analyses are recommended in future reporting.

As discussed in Section 4.1, financing for water resources management on average lags the other three main aspects of IWRM by about 10 points.

The lowest-scoring question in the questionnaire concerns the status of subnational or basin budgets for investment in water resources management, including water resources infrastructure (Q.4.2a), with an average implementation of 35 out of 100.[38] More than half (57 per cent) of countries report either not allocating any budget at the subnational level, or that the budget allocated only partly covered planned investments (very low and low). A further 22 per cent of countries report that, even when budget is allocated, insufficient funds are disbursed for the planned investments (medium-low). In total, then, a staggering 79 per cent of countries report insufficient funds reaching the planned investments for water resources management at subnational levels (Figure 27).

The lack of funding for water resources management compares to the situation for water supply, sanitation and hygiene (WASH), for which over 80 per cent of countries report insufficient financing to meet national targets.[39]

National-level budgets for investment in water resources management fare slightly better, with an average score of 40. Nevertheless, roughly half (51 per cent) of countries report

The vast majority (79 per cent) of countries have insufficient budget (allocated or disbursed) at subnational or basin levels to cover planned investment in water resources management. This will significantly hinder the achievement of Goal 6 and its targets, as well as other targets across the SDGs.

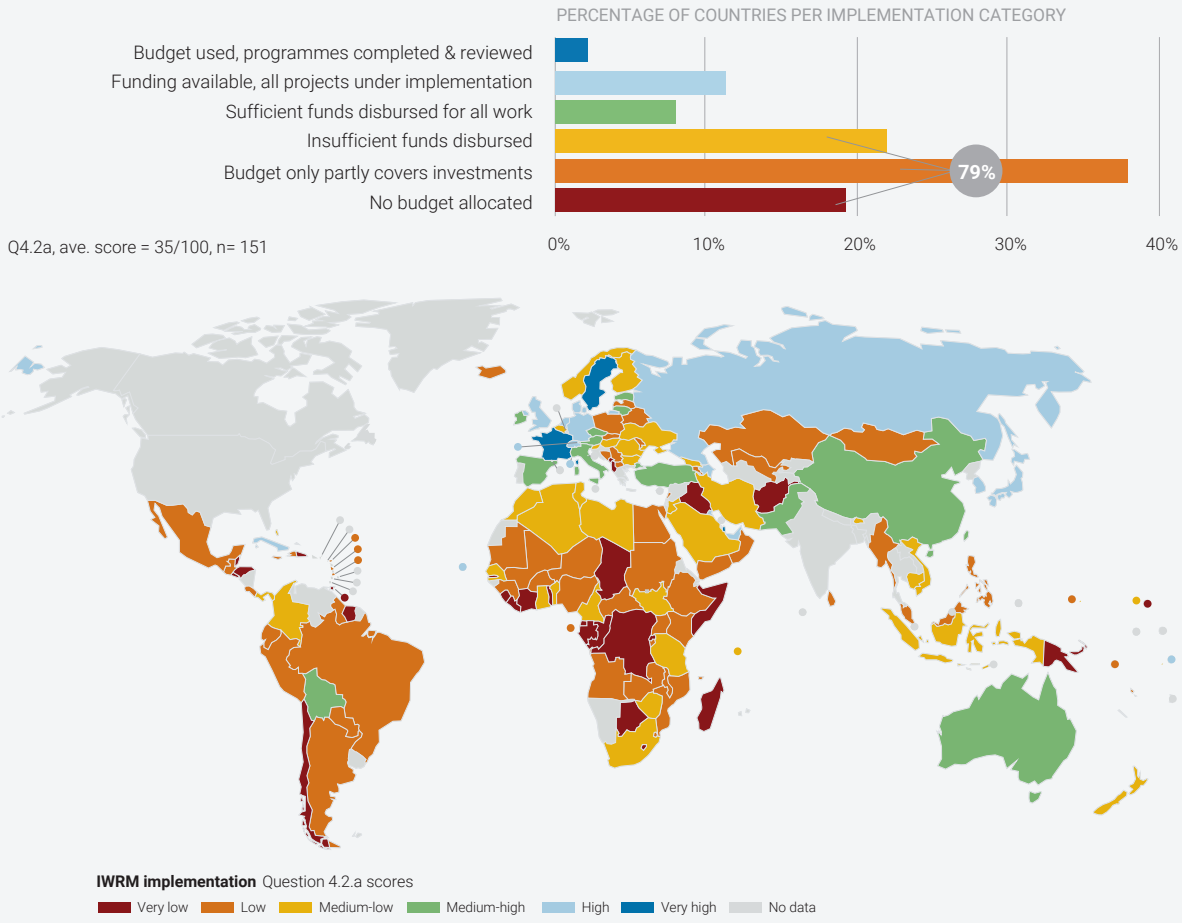

Figure 27 Subnational or basin budgets for investment, including water resources infrastructure (Q4.2a)

[38] The average global average implementation level for gender objectives at the transboundary level is 32; however, that question has some methodological challenges, as discussed in Section 4.3.

[39] World Health Organization (WHO) (2017). *Financing universal water, sanitation and hygiene under the Sustainable Development Goals.* UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) 2017 report. Geneva.

either that no budget is allocated, or that the budget only partly covers planned investments (Annex B, Q.4.1a). A similar picture emerges for national budgets for recurring costs of IWRM activities, with 48 per cent of countries reporting that budget allocations are made for only a few of the elements, and that implementation is at an early stage (Annex B, Q4.1b).

The responses clearly demonstrate that major tools to achieve target 6.5 are financial; accessing financial resources, allocating sufficient budget, and ensuring that all funds are disbursed would be major enablers to progress:

1. Public funding will always be limited in both scale and allocation to simultaneously invest across the full range of the SDGs. Revenue generation and allocation are therefore priorities for sustainable development more broadly, and interventions that can impact across the SDG's should be prioritized.
2. Though funds may flow from national levels, important actions to tackle water management problems take place at basin and local scales. Thus, the situation requires a clear national commitment to address water management challenges, so that institutions and agencies at basin and municipal levels have the mandate to coordinate management and planning activities across other sectors.
3. Diversifying funding streams, including through the private sector, will be critical for sustaining and advancing integrated water resources management (see Section 6.2).

Roughly a third (36 per cent) of countries report that revenue sources do not include dedicated levies on water users at basin, aquifer or subnational levels (Figure 28). A further 30 per cent report that these sources do provide limited revenues, but these are not spent on water resources management activities.

Nearly all countries (90 per cent) report insufficient revenue raising to cover most IWRM activities. Roughly one third (36 per cent) of countries report that no revenue is raised for such activities at basin, aquifer or subnational levels.

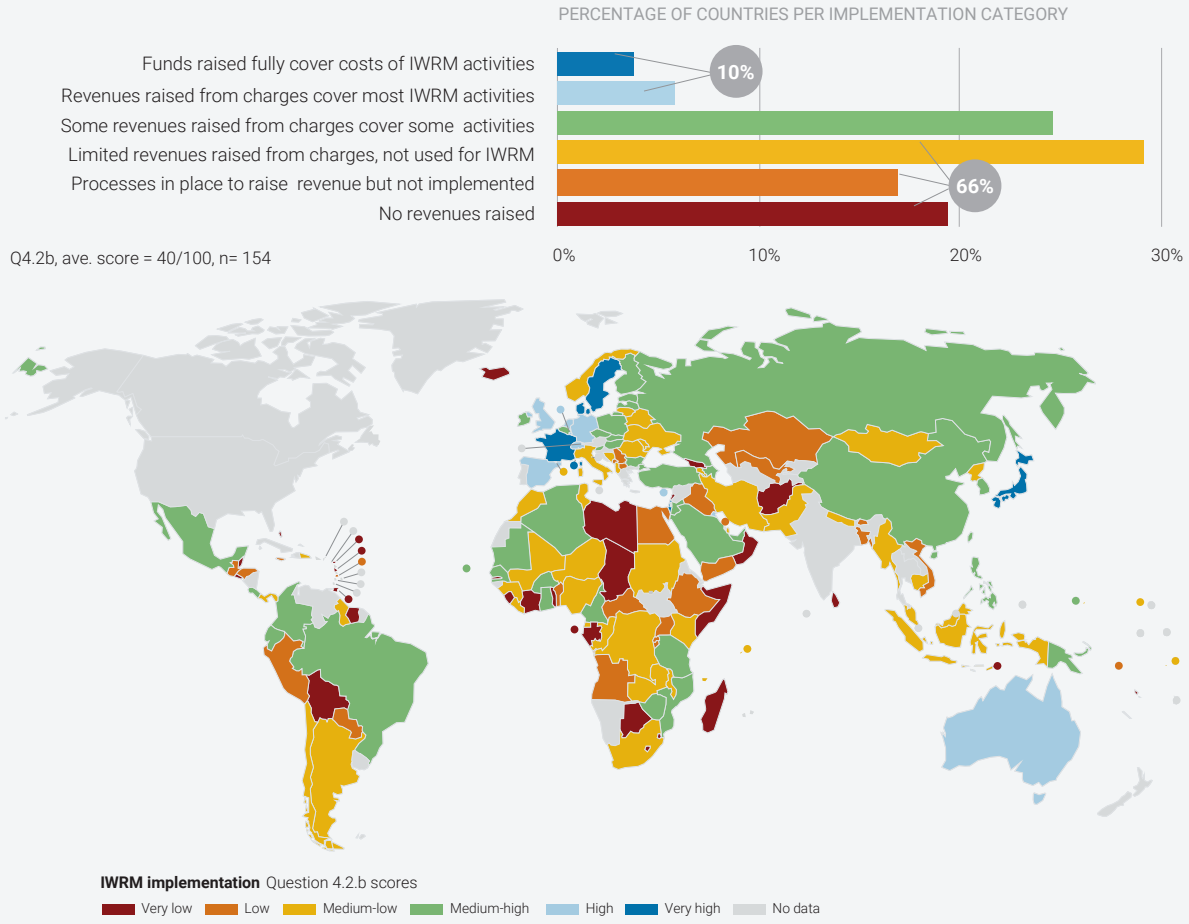

Figure 28 Revenues raised from users at basin, aquifer or subnational levels (Q4.2b)

BOX 22

FEW COUNTRIES PROVIDE EXAMPLES OF EFFECTIVE REVENUE RAISING.

Most countries have legal provision for applying charges for at least some of: water use, water abstraction, water pollution permits or offences, or wastewater management. Nevertheless, some countries still lack provision for raising revenue from water (Togo, Tuvalu, Swaziland, South Sudan, Serbia, Lesotho, Guatemala, Uzbekistan).

In most cases, revenue is collected for or by the national structures (Barbados, Croatia, Mauritius, Malawi, Mexico, Slovenia). The national treasury, rather than the water agency may receive and disperse such revenues (Uganda, St Kitts and Nevis). Most countries state that revenues are very small and seldom used for IWRM. In Sudan, the bulk of revenues are allocated for operations and maintenance. In Nepal, the revenues provide less than 5 per cent of the costs of supplying irrigation water. In Mali, the collection of subnational water-related fees and charges is low. Meanwhile, 30-40 per cent failure rates of water-related public works there reveal the lack of sorely needed maintenance. In Mongolia, though revenues from water users at the basin level increase every year, financing and investment for water do not.

On the positive side, the Republic of Korea and Algeria both state that at least some revenues generated support a specific fund for IWRM. The Dominican Republic has a new law promoting pilot initiatives on Payment for Environmental Services (PES). This aims to be a national system of compensation and payment that contributes to natural resources conservation, and to poverty reduction in rural communities. The European Water Framework Directive established the principle of cost recovery of water services, and European Union member countries provide the lone examples in which costs of IWRM are reported to be fully covered by revenues (Denmark, France, Monaco, Sweden).

Means of raising revenue include charges for water abstraction and bulk water, and environmental fees such as pollution charges, Payment for Ecosystem Services (PES) plans, and the sale of secondary products and services. Only 10 per cent of countries report that local authorities raise funds from multiple sources, and that the funds mostly or fully cover the costs of IWRM activities (high and very high) (Figure 28 and Box 22). The vast majority (90 per cent of countries) report insufficient revenue raising to cover most IWRM activities. By contrast, 55 per cent to 76 percent of countries indicate that revenues from tariffs cover the majority of operations and basic maintenance costs for WASH services (as measured by responses concerning drinking water and sanitation for rural and urban areas).[40]

[40] Covering the majority of operating and maintenance costs for water, sanitation and hygiene (WASH) was defined as recovering more than 80 percent of such costs. See Figure 26 in: World Health Organization (WHO) (2017). *Financing universal water, sanitation and hygiene under the Sustainable Development Goals.* UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) 2017 report. Geneva.

THE IMPORTANCE OF IMPLEMENTING IWRM ACROSS SECTORS FOR AGENDA 2030

5

5.1 IMPLEMENTING IWRM ACROSS SECTORS

KEY RECOMMENDATIONS FOR IMPLEMENTATION ACROSS SECTORS

1. Various projects and programmes of different sectors implement water resources management; thus, critically, these sectors need to adopt integrated approaches to water resources management. Water resources authorities should facilitate coordination – and foster dialogue and understanding – within and among sectors where possible.

2. Accelerating water resources management implementation will require increased attention and funding in most cases. There are innovative opportunities for joint financing of projects and programmes across sectors to achieve multiple objectives and to maximize positive impacts.

3. Efforts should be made towards shared decision-making power and responsibility between sectors on joint policy, planning and management activities.

4. Implementing programmes for water supply, wastewater treatment, water-use efficiency, and ecosystem protection, as addressed through each of the Goal 6 targets, all provide opportunities for implementing elements of integrated water resources management. These should all go ahead as fast as possible to reach Goal 6, with actions coordinated to ensure equity and sustainability.

Direct and indirect interdependencies link Goal 6 targets and every other Sustainable Development Goal.[41] As the demand for water brings together different sectors. So, each sector has an interest in its sustainable management and supply. The very essence of integrated approaches to water resources management is making sure that different sectors speak to each other, and seeing that they coordinate key plans and actions.

The implementation of integrated approaches to water resources management (Target 6.5) supports the achievement of the other targets in Goal 6 in an equitable and sustainable manner. Such integration helps to balance the demands on water resources from various sectors, to increase the visibility of potential impacts of different targets on each other, and to form a coordinated planning and management framework. Only by treating each target in an integrated fashion can Goal 6 be achieved. For example, increased access to sanitation must be matched by increased wastewater treatment to sustain good ambient water quality and healthy water-related ecosystems. Good ambient water quality greatly facilitates the provision of safe drinking water, which, in turn. must be provided sustainably, without negative consequences for water-related ecosystems. Increasing recycling and safe reuse and water-use efficiency under the right governance structures makes more water available for drinking and other uses, and can reduce impacts on water-related ecosystems.[42]

An assessment the interdependence between the Goal 6 targets, through a cross analysis of the indicators, would help to understand the impacts, benefits, and challenges of working towards the targets in an integrated fashion. However, within the timeframe of this reporting cycle, this has not been possible, partly due to simultaneous data collection and reporting periods across indicators, and partly due to the relatively low data coverage for some indicators at the time of writing. While the 2018 SDG 6 indicator reports and synthesis report were developed somewhat in parallel, more data should become available as the monitoring efforts across the indicators gather momentum, and as more robust national and global datasets are developed.[43] Nonetheless, many countries may already have the information and incentive to explore interlinkages and impacts as part of their planning and management processes at national, subnational, and even transboundary levels.

Similarly, a data-based assessment of interlinkages between SDG 6.5.1 and the other goals beyond Goal 6 has not been possible for this report. However, this type of analysis is recommended, and will be considered in future reporting.

Thus, this section draws on data from 6.5.1 that reflects on cross-sectoral coordination, as well as some more conceptual ways in which IWRM may be implemented across sectors. This can be explored in more detail in future reporting as more data from other SDG indicators become available.

[41] UN-Water (2016). *Water and sanitation interlinkages across the 2030 agenda for sustainable development*. Geneva.

[42] UN-Water (2016). *Water and sanitation interlinkages across the 2030 agenda for sustainable development*. Geneva.

[43] United Nations (2018). *Sustainable Development Goal 6 Synthesis Report 2018 on water and sanitation.* New York.

Cross-sectoral coordination

In 69 per cent of countries there are currently opportunities for different sectors to actively participate in policy, planning and management processes related to water resources management (medium-high and above, Figure 29). This indicates that the foundations for cross-sectoral coordination are already in place in most countries (Box 23). Efforts should be made towards shared power and responsibility between sectors on policy, planning and management activities.

A further 30 per cent of countries report that there is at least some communication or consultation between government authorities (medium-low and low implementation). Only 1 per cent of countries reported no communication between government sectors.

Roughly two thirds (69 per cent) of countries have at least opportunities for different sectors to actively participate in policy, planning and management related to water resources management.

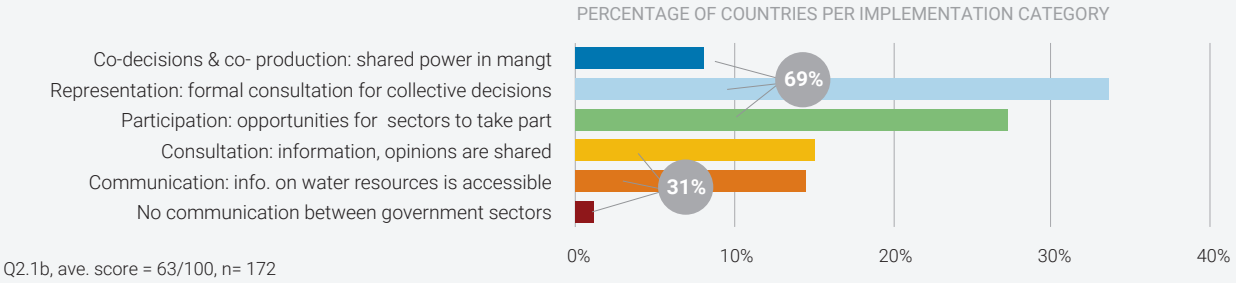

Figure 29 Coordination between national government authorities representing different sectors on water resources, policy, planning and management (Q2.1b)

BOX 23

CROSS-SECTORAL COORDINATION MECHANISMS ARE COMMON, BUT MANY COUNTRIES STILL REPORT WEAK COORDINATION IN PRACTICE.

Most countries report the existence of coordination structures at the national level. These take various forms, such as inter-ministerial committees (Uganda, Turkey, Norway, France), constituted councils (Afghanistan) that may include stakeholders beyond government agencies (Belize, Benin), and other formal and informal inter-ministerial and public consultations and exchanges (Australia, the United Kingdom). The water authority itself may include a mix of inter-sectoral, inter-ministerial, regional, and stakeholder representation (Zimbabwe, Peru, Niger). The recognition of water as a complex resource with competing and sometimes conflicting uses and benefits appears to have been well understood at a policy level.

In practice a good number of countries report relatively weak coordination (Armenia, Ethiopia, Guatemala, Lebanon). Even when IWRM is well established, conflicting interests surface (Netherlands). This is to be expected, and it underscores the rationale that an integrated approach to water management needs to be a continuous process that takes place beyond planning stages. As shown from the workshops (Box 4, Section 2.3) integration works well at the consultation stage. Coordination of implementation becomes more problematic due to mistrust (Armenia), the absence of formal mechanisms (Ethiopia), a lack of information exchange (Serbia, Seychelles), or a lack of power sharing (Zimbabwe).

All sectors implement water resources management

Working towards the common goals of Agenda 2030 provides further impetus and a framework for integrating across sectors. It is generally accepted that working towards the SDGs in an integrated fashion offers the best chance to achieve them.[44]

Integrated water resources management provides a framework to ensure that the key elements of sustainable water management are considered in a holistic fashion. But the implementation of these elements is likely to require operating mechanisms that provide platforms to bring stakeholders together to collaborate, negotiate and innovate.[45] Some of these operating mechanisms may be familiar to the water "sector", while others will be more familiar to other water-dependent sectors such as agriculture, manufacturing and power generation. In these sectors, water will seldom be placed at the centre, but rather will be seen as one factor out of many to consider in balancing the three dimensions of sustainable development.

There are numerous areas of sustainable development, as highlighted through the SDGs, that can provide opportunities for implementing IWRM. While it is beyond the scope of this report to discuss them all, some key areas include:

- Sustainable agriculture and food security (SDG 2)
- Sustainable cities and communities (SDG 11)
- Disaster risk reduction and resilience (SDG 11)

Examples of ways to support these areas:

- National or subnational programmes and planning processes related to the above areas
- Water-food-energy-ecosystems nexus activities
- Appropriate and sustainable corporate water stewardship approaches
- The ecosystem approach / nature-based solutions activities
- Implementation of water supply, sanitation, wastewater treatment and reuse services
- Source-to-sea and ridge-to-reef activities
- Integrated flood and/or drought-management projects

Many of the above will be important for countries working towards target 6.5, as discussed in Chapter 6.

© UN Photo / Martine Perret

[44] International Council for Science and the International Social Science Council (2015). *Review of targets for the Sustainable Development Goals: the science perspective*. Paris.

[45] Smith, M. and Clausen, T.J. (2018). *Revitalising IWRM for the 2030 Agenda: World Water Council Challenge Paper for the High-Level Panel on IWRM at the Eighth World Water Forum.* Brasilia.

5.2 SUSTAINABLE AGRICULTURE AND FOOD SECURITY PROGRAMMES

MAIN SDG: 2

Primary related Goals:

Non-SDGs: Aichi Biodiversity Targets

Agriculture accounts for approximately 70 per cent of water withdrawals globally, and agricultural runoff accounts for significant amounts of pollution. Thus, this is clearly an important sector. While food security and sustainable agriculture are rooted in Goal 2, these aims require integration across several Goals, including Goal 6. All countries are expected to have programmes related to sustainable food and agriculture.[46] These programmes are likely to provide key operating mechanisms for the implementation of elements of water management, such as water-use efficiency programmes, and pollution-control programmes. In many countries, ministerial responsibility for water resources is connected to agriculture, which should facilitate the sustainable development and use of water resources within agriculture, though consideration of impacts on other sectors must occur if this is to be realized. Here, coordinating approaches such as the water-food-energy-ecosystems nexus are important.

Water withdrawals and pollution are not the only connection to food and agriculture. Globally, roughly one third of all food produced for human consumption every year is wasted. Thus, working on food waste-reduction programmes is another way of working towards ensuring water availability for all.

Sustainable agriculture is most explicitly addressed through SDG Target 2.4: "By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality." However, indicator 2.4.1 – "proportion of agricultural area under productive and sustainable agriculture" – is still under development.

5.3 SUSTAINABLE CITIES AND DEVELOPMENTS

MAIN SDG: 11

Primary related Goals:

In the future, a cross analysis of areas with high agricultural withdrawals, high water stress, and low IWRM implementation may help to prioritize efforts to implement sustainable agriculture.

Water supply – for domestic, commercial and industrial users – and sustainable consumption, sanitation, and wastewater treatment and re-use are critical elements of reducing poverty, creating good working conditions, and making industrialization sustainable. Clearly, implementing targets under Goal 6 is important here, particularly on water supply and sanitation for all (6.1, 6.2), wastewater treatment and re-use (6.3), and efficient water use (6.4) (Box 24). Governmental responsibility for these activities may lie within different departments. Coordination between these departments, and engaging with the private sector and other non-governmental organizations are key elements of IWRM. Consequently, implementing these targets provides operating mechanisms for IWRM implementation.

Another important area for sustainable cities and developments is the supply of renewable energy (Goal 7). Hydropower and biofuels may be part of the renewable energy options, and their impacts on water availability for other sectors need careful consideration.

The need for improved coordination is perhaps acute in countries with high population growth and low levels of IWRM implementation (Figure 30). The situation is even more urgent in such countries that also have high levels of water stress, a condition that is projected to increase in most regions (indicator 6.4.2).[47]

The private sector is becoming more aware of its impacts and responsibilities as a water user. Corporate awareness is also growing regarding sustainable water resources management. Corporate Water Stewardship provides a possible operating mechanism for implementing some elements of IWRM.

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[46] At the global level, FAO has a vision for sustainable food and agriculture, based on five principles: efficiently using resources; conserving and protecting natural resources; protecting rural livelihoods and social well-being; enhancing resilience of people, communities and ecosystems; and building responsible and effective governance mechanisms.

[47] United Nations World Water Assessment Programme (WWAP) and UN-Water (2018). *The United Nations World Water Development Report 2018: nature-based solutions for water*. Paris: UNESCO.

The need for improvements in coordination between governmental and non-governmental organizations is most acute in countries with high population growth and low IWRM implementation (bottom-right quadrant).

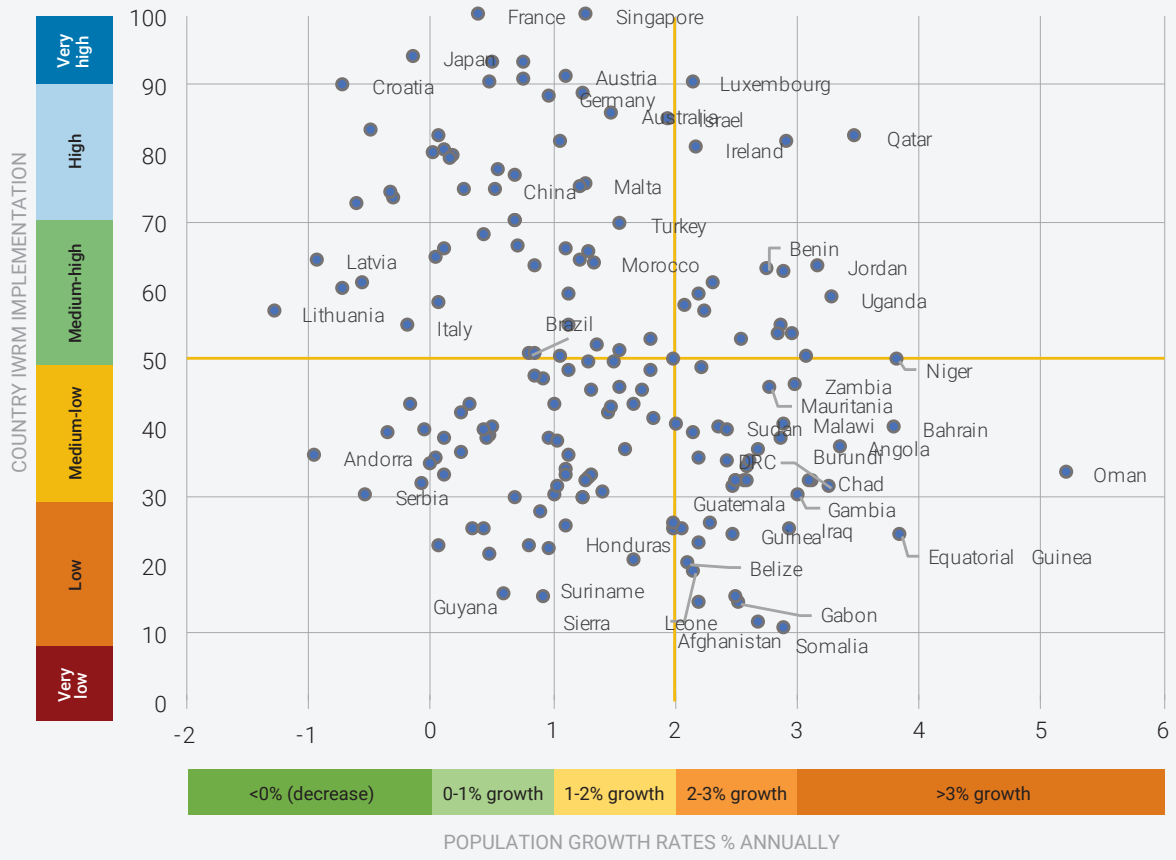

Figure 30 Population growth and IWRM implementation by country

BOX 24

INTEGRATED APPROACHES FOR RESILIENT AND SUSTAINABLE CITIES.

Few references to urban areas emerged from the questionnaires. The Dominican Republic describes the Santo Domingo Water Fund created to guarantee investment resources aimed at the restoration and conservation of ecosystems in the watersheds that supply water to the city of Santo Domingo. The objective of the fund is to guarantee water availability in sufficient quantity and quality to meet the needs of users of the city. The fund operates through capital contributions made voluntarily by large water users, as well as with donations from companies and individuals. Such water funds are being established in other countries to raise revenue to address local water management issues, both urban and rural. They provide one mechanism to address some of the funding challenges in IWRM implementation (Section 4.5).

5.4 DISASTER RISK REDUCTION AND RESILIENCE PROGRAMMES

MAIN SDG: 11

Primary related Goals:

Non-SDGs: Sendai Framework and Paris Accord.

Countries may have different capacities, perspectives, and mechanisms to mobilize stewardship programmes at the basin or national levels. At the global level the CEO Water Mandate provides a framework for private-sector participation in water resources management and use.[48]

Many SDG targets mention resilience, which is generally characterized as related to either physical (climatic/geophysical) or societal/political stresses. Between 1980 and 2016, 90 per cent of disaster events were weather related, and 80 per cent of economic losses stemmed from floods, droughts and storms.[49] Collaboration over water resources, both within countries and across borders, can be an important element in conflict management in many regions, particularly in times of weather-related crisis.[50]

Therefore, disaster risk programmes, and increased resilience across various sectors at different levels provide operating mechanisms for implementing elements of IWRM. Globally, the implementation of management instruments to reduce the impacts of water-related disasters is relatively evenly distributed between the implementation categories (Figure 31).

It has been suggested that financing for water-related disaster risk reduction should double globally in the next five years.[51]

Water-related disasters are most explicitly addressed in the SDGs through Target 11.5: "By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations." Indicators 11.5.1 and 11.5.2 deal with the human and economic impacts of disasters, respectively. While the overall indicators include all disasters, it should be possible to disaggregate by types of disasters, including water-related disasters. It is recommended that UN Environment works with the custodian agencies of indicators 11.5.1 and 11.5.2 to obtain this information in the future. These indicators are also monitored under the Sendai Framework for Disaster Risk Reduction.[52]

5.5 NATIONAL CONTEXTS ARE CRITICAL FOR CROSS-SECTORAL COORDINATION

Ultimately, countries understand the main challenges they face in terms of cross-sectoral coordination to balance needs and impacts across sectors. Thus, while global analyses are useful for broad-scale overviews and prioritization, national and subnational activities are imperative to identify needs for coordination, identify mechanisms and financing for IWRM implementation, and implement plans across sectors.

While 27 per cent of countries report implementing effective management instruments, another 25 per cent either have no instruments, or have only short-term, ad hoc projects for disaster risk reduction. Significant effort and financing are required to increase resilience to water-related disasters in these countries.

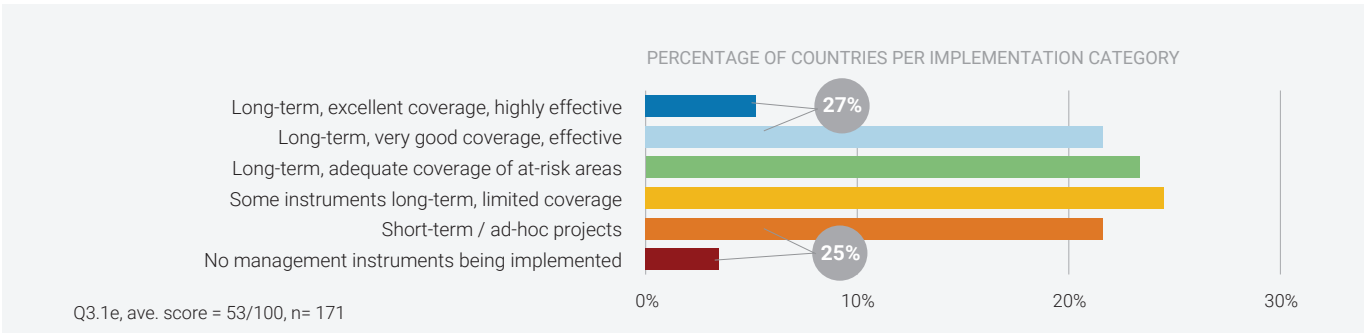

Figure 31 Implementation of management instruments to reduce impacts of water-related disasters from the national level

[48] https://ceowatermandate.org

[49] Global Water Partnership (2018). *Climate insurance and water-related disaster risk management – unlikely partners in promoting development?*

[50] World Bank, United Nations Department of Economic and Social Affairs (2018). *Making every drop count: an agenda for water action.* New York: High Level Panel on Water.

[51] World Bank, United Nations Department of Economic and Social Affairs (2018). *Making every drop count: an agenda for water action.* New York: High Level Panel on Water.

[52] United Nations (2015). *The Sendai framework for disaster risk reduction 2015-2030. Sendai, Japan.*

TOWARDS FULL IMPLEMENTATION OF INTEGRATED WATER RESOURCES MANAGEMENT

6

6.1 PROGRESS ON IMPLEMENTATION OF INTEGRATED WATER RESOURCES MANAGEMENT

Countries have long recognized the benefits of implementing integrated approaches to water resources management, which has resulted in several global agreements.

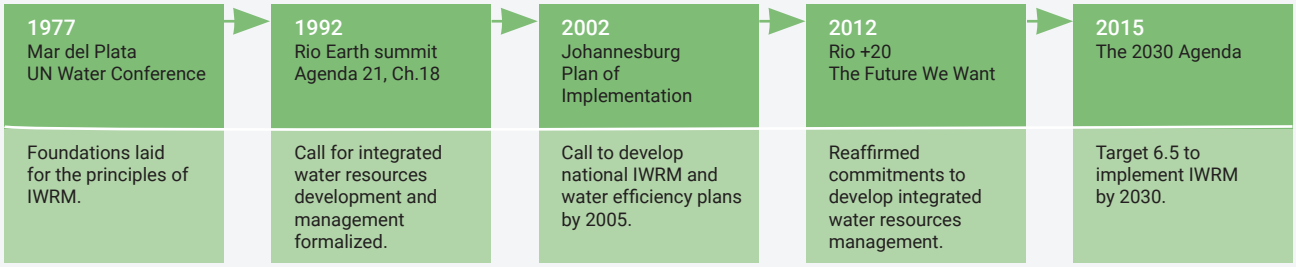

Figure 32 Key global agreements on implementing integrated approaches to water resources management[53]

Encouraged by the above agreements, all countries have been implementing elements of integrated water resources management over the years.[54] Global status reporting in 2008[55] and 2012[56] showed that the 2005 target for completion of national IWRM plans had been only partly met. Nonetheless, the 2012 status report concluded that 80 per cent of the 134 countries included in the survey had embarked on reforms to policies and laws based on IWRM.

IWRM implementation was included as a separate target under SDG 6 because countries found that this process-oriented target was crucial for the achievement of the desired impacts captured under the other SDG 6 targets (see Box 2, section 1), and because countries acknowledged the continued challenges in implementing IWRM on the ground. The IWRM implementation status reported by countries during this baseline survey must be interpreted in the light of an aspirational target and a long-term process.

The global average (from the 172 reporting countries) of the overall IWRM implementation score is 49 on a scale from zero to 100. As described in Chapters 3 and 4, this global average value masks a very wide range of scores among countries – from 10 to 100 – and considerable variation between sub-scores within countries.

A direct comparison between the current global baseline survey reported here and previous global IWRM status surveys is not straightforward. Survey instruments include slightly different questions, and the response options are not the same. One way to assess progress is to compare the similar questions on development and implementation of IWRM plans posed in the 2007, 2011 and 2017/18 surveys for a set of 57 countries that participated in all three surveys (Figure 33).

It is not possible, based on the available survey data, to conclude whether the progress towards IWRM implementation has slowed, maintained a steady pace, or accelerated – or whether countries are on track to achieve SDG target 6.5 by 2030. Such an analysis will have to await the results of subsequent reporting of SDG indicator 6.5.1, using a methodology that is directly comparable to the one used in this baseline.

What we can conclude based on country reporting is that, given the long-term and, thus, slow progress experienced over the past decades, and given the wide spread of baseline scores, a business-as-usual approach will likely result in **only a minority of countries achieving SDG Target 6.5 by 2030**. Countries likely to achieve the global SDG 6.5 target are predominantly high and very high Human Development Index (HDI) countries.

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[53] Sources:
United Nations (1977). *Report of the United Nations Water Conference.* Mar del Plata, Argentina
United Nations (1992). *The Rio Declaration on Environment and Development,* Rio de Janeiro;
United Nations (2002). *Plan of implementation of the World Summit on Sustainable Development*. Johannesburg;
United Nations (2012). *The future we want: outcome document of the United Nations Conference on Sustainable Development*;
United Nations (2015). *Transforming our world: the 2030 agenda for sustainable development*.

[54] See, for example, the Global Water Partnership's Water Governance Results Map. https://www.gwp.org/en/interactivemap/. Accessed 26 July 2018.

[55] UN-Water (2008). *Status Report on Integrated Water Resource Management and Water Efficiency Plans.*

[56] United Nations Environment Programme (UNEP) (2012). *The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management.*

Barriers need to be removed or reduced to accelerate progress, and to enable more countries to achieve the target. (Box 25 identifies some common barriers.) The most serious obstacles – capacity and financial constraints – are discussed below. (Chapter 5 discusses coordination challenges and opportunities across sectors.)

Countries have made significant progress in implementing IWRM plans over the last 10 years. (More countries are now in higher green-blue categories. Fewer countries are in red-orange categories.)

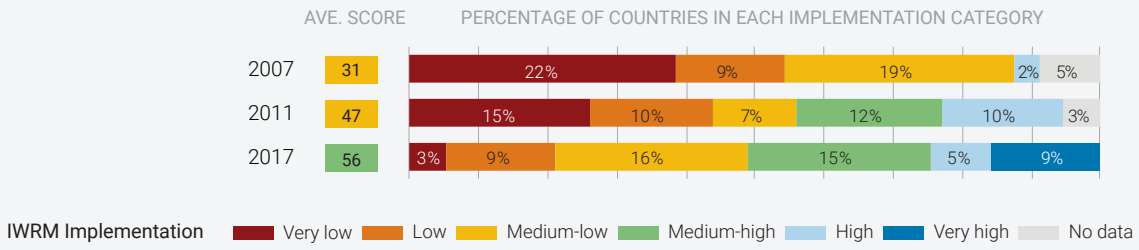

Figure 33 Status of implementation of IWRM plans 2007-2018. Information is based on 57 common countries. Results from 2007 and 2017 are rescaled to allow comparison with 2017/18 survey results.

6.2 ADDRESSING BARRIERS AND CONSTRAINTS TO PROGRESS

In 2012, countries reported a wide range of challenges that constitute IWRM implementation barriers, including financing, institutional capacity, stakeholder engagement, knowledge and information sharing, and coordination between levels and sectors[57]

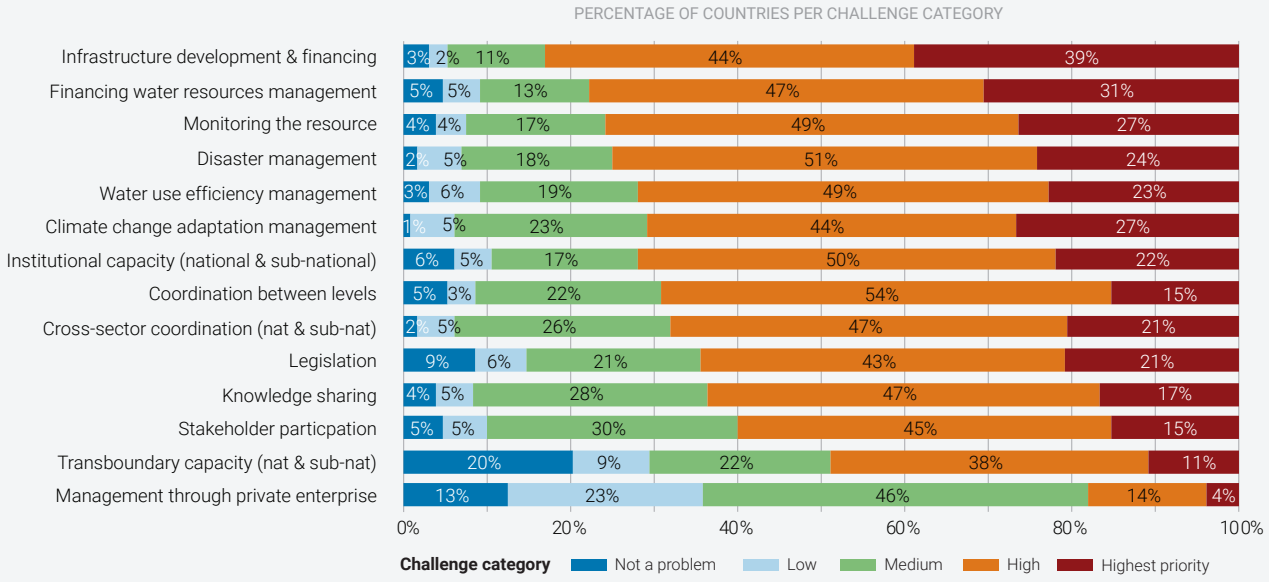

Figure 34 Challenge areas for water resources management, reported by 133 countries in 2012

[57] United Nations Environment Programme (UNEP) (2012). *The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management.*

For the 6.5.1 indicator baseline in 2017/18, countries were not specifically asked to reflect on their main challenge areas for water resources management. Nevertheless, through workshop reports and free text responses to questions, many countries confirm that these challenges continue to pose barriers to implementation (Box 25). In future review of the 6.5.1 methodology, it is recommended to consider incorporating into the survey the identification of key challenge areas, and reflections on barriers and enablers to progress.

Capacity Constraints

Countries often emphasize limited capacity as an important, long-term barrier to IWRM (Box 26). Just over half of all countries report having government authorities with the capacity to lead IWRM plan implementation (medium-high implementation and above) (Figure 35).

Nearly half (43 per cent) of countries have national authorities for leading IWRM plan implementation, but their capacity is insufficient for implementation.

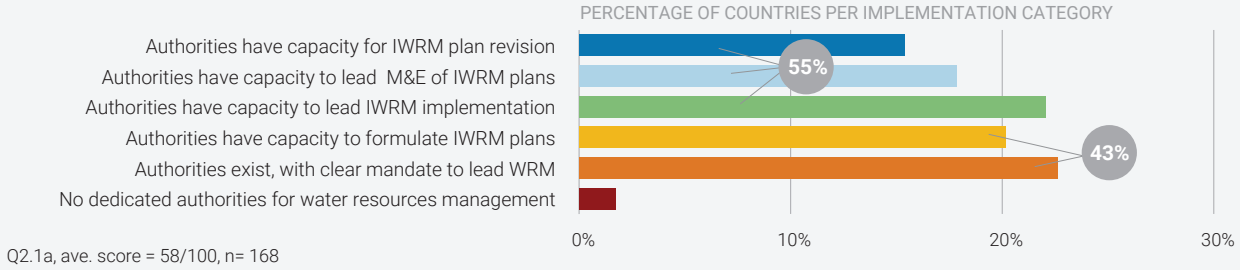

Figure 35 National government authorities' capacity for leading implementation of national IWRM plans or similar

BOX 25

BARRIERS TO IWRM IMPLEMENTATION.

Achieving sustainable water resources management through an IWRM approach has been high on the international water agenda for over 25 years. Previous reports have shown huge progress in most countries and regions. However, it is clear that obstacles, whether political, social, economic or ideological, can halt further advancement for years. Several countries report that policies, laws or plans are either not adopted almost a decade after being drafted (Guyana, Kazakhstan), or are not being implemented by the majority of authorities a decade after adoption (Iceland, Kazakhstan), although this need not stop progress being made on other elements of IWRM (Box 10, Chapter 4). Barriers most frequently reported are:

- The failure to operationalize, enforce and monitor compliance with laws (Sudan, Tanzania, Zimbabwe, Armenia)
- Unclear or overlapping responsibilities that result in reduced interagency cooperation from conflicting interests or policies (Netherlands, Sudan, Serbia, Suriname)
- A shortage of funding, sometimes due to donors withdrawing because of political instability (Burundi, Cote d'Ivoire), but usually stemming from national budget limitations (Iceland, Malawi, Togo). These budget limitations become much more evident at subnational levels (Botswana, Malaysia, Tanzania, Yemen)
- A shortage of human capacity for planning or implementation, especially at subnational levels, which affects the status of water management structures, and impedes their ability to plan, assess and monitor activities (Kazakhstan, El Salvador, Ghana, Tanzania, Macedonia, Swaziland, Papua New Guinea, Malaysia).

Capacity development is one of the more important elements needed to speed progress with IWRM. Such development should go along with realistic appraisals of funding and revenue-generation opportunities.

More than half (58 per cent) of countries report either occasional, short-term capacity development activities, or some long-term initiatives, but with limited geographic and stakeholder coverage.

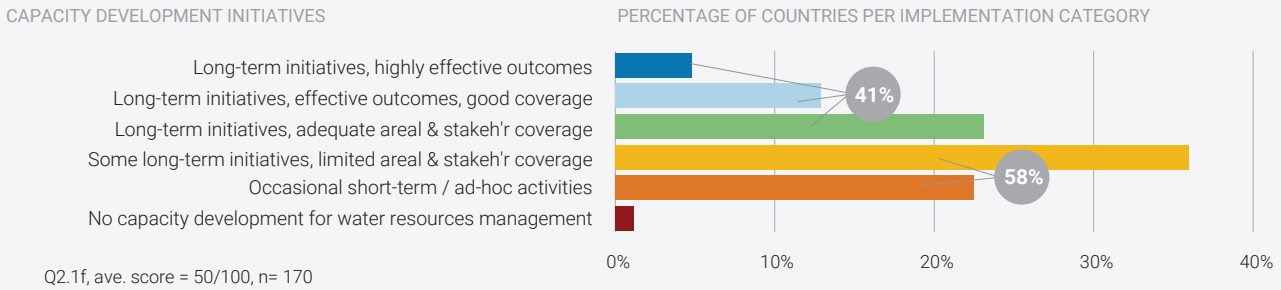

Figure 36 Capacity development initiatives for water resources management, including enhancement of skills, instruments, resources and incentives for people and institutions at all levels

BOX 26

CAPACITY CHALLENGES NEED LONG-TERM COMMITMENT.

Many countries have introduced IWRM into formal education, either as new stand-alone programmes or as components of other programmes (Cameroon, Austria, Ethiopia). However, countries repeatedly raise concerns over shortages of capacity. Though ad hoc courses are common (Benin, Bulgaria, El Salvador) widespread concerns remain about the lack of sustainable capacity development, and the lack of penetration/ outreach to actors on the ground. Burkina Faso has a human resources development plan in place, and it has implemented training throughout the water management structures. By contrast, Benin has restricted training to pilot areas, and it identifies an unmet need for capacity development at the national level. Some countries target school children (Argentina, Burkina Faso). Several countries report significant benefits from transboundary capacity development programmes, especially where there is a lack of national capacity development (Botswana, Cambodia, Côte d'Ivoire).

Little evidence from the questionnaires suggests capacity development in sustainable management of water resources has penetrated into water-use sectors, such as agriculture, environment, and urban planning – all of which have a large influence on sustainable use of water resources. This lack of information may be due to the limited target group for the questionnaire and the formulation of the questions themselves.

The report makes clear the consequences of a lack of capacity. Countries report problems with enforcement of regulations, an inability to prepare and implement plans, and inadequate management capacity to address technical and financial issues. The implementation of IWRM plans at basin/aquifer levels (Box 13) represents one specific area in which countries repeatedly identify a lack of capacity development as responsible for impeding progress. Overall, the variation in capacity-related problems – which arise from a mix of conditions of service, recruitment processes, staff management, educational quality and the wide scope of the possible target groups – means that solutions need to be designed in the national context. Typically, solutions require more reliable and increased finance.

Financing

Access to adequate finance is a general constraint for development, and IWRM is no exception. As described in Section 4.5, country scores on finance average 10 points lower than scores in the other sections of the survey. The need to allocate financial resources specifically towards water resources management often goes unrecognized, leaving countries entirely reliant on sparse government budgets supplemented by ad hoc project funding. For many countries, overseas development assistance (ODA) may provide an important source of financing. (Indicator 6.a.1 addresses this issue.) Overseas development disbursements for the water sector grew by 67 per cent over a 10-year period, reaching a level of US$ 8.6 billion in 2015. Yet, as a proportion of total ODA, water-sector disbursements have remained relatively constant at about 5 per cent since 2005.[58] To achieve sustainable financing, revenue raising from user charges is a critical element, and needs to be drastically improved (Section 4.5, Figure 28).

Investment by the private sector in basin management actions remains relatively low. Nevertheless, rapid progress is taking place in this area, with some notable activities in Africa (including South Africa and Tanzania) and California, to mobilize collective action for water resources management using private interests and finance to spark investment in activities to improve river basin management.[59]

Blended financing approaches should also be considered to help mobilize a wider range of financial sources. The advantages of intersectoral collaboration are the ability to coordinate and prioritize financing, and the opportunity to attract a range of investors, such as regional, national and local banks, and private-sector and philanthropic finance. A lack of innovation and institutional will to diversify and mobilize finance represents a serious impediment to implementing effective water resources management. Some countries report on related initiatives, which may serve as inspiration (see, for example, boxes 14 (Section 4.3) and 24 (Chapter 5)).[60]

6.3 ACTIONS IDENTIFIED BY COUNTRIES TO ADVANCE SUSTAINABLE MANAGEMENT OF WATER RESOURCES

Countries can take many actions and steps to advance the management of their water resources. No recipe dictates a fixed sequence for these steps (Box 10, Chapter 4). Countries should move ahead with initiatives and actions that respond to their specific needs. They should seize opportunities. As part of the country reporting on which this status report is based, countries provide a wealth of examples of practical IWRM initiatives that may inspire other countries to act. This is a significant outcome of the SDG monitoring process.

Most countries will identify with the actions being taken elsewhere because they face, or have already addressed, similar issues. The list below is intended to be inspirational, rather than exhaustive, arising as it does from only a modest number of countries. Actions should be determined and prioritized by individual countries.

Enabling environment of laws, policies and plans.

1. Advance national water policies, plans and laws into operation through awareness raising and supporting regulations (Burundi, Argentina, Armenia, Cambodia, El Salvador, The Gambia, Tanzania, Ukraine).

2. Develop watershed management plans (Argentina).

3. Establish or improve enforcement and oversight mechanisms (Armenia, Mongolia, Guatemala).

4. Elaborate and formulate groundwater legislation (China, Burundi).

5. Harmonize transboundary water laws (Burundi).

Institutions and stakeholders

1. Ensure that national and subnational structures are in place, and that they have the capacity to carry out their functions.

    - Increase the status and coordination capacity of the Water Committee (Kazakhstan, Mongolia).

    - Give the water regulator independent status by separating it from the Ministry of Agriculture and Water Resources (Uzbekistan).

[58] These figures for the water sector captured under Goal 6 include: WASH, wastewater treatment, water resources conservation, development and management, agricultural water resources, flood protection, and hydroelectric power. See Annex C of World Health Organization (WHO) (2017). *Financing universal water, sanitation and hygiene under the Sustainable Development Goals.* UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) 2017 report. Geneva.

[59] Newborne, P. and Dalton, J. (2016). *Water management and stewardship: taking stock of corporate water behaviour*. Overseas Development Institute.

[60] See also descriptions of "water funds", which are multi-stakeholder platforms developed by cities and conservation practitioners to help resolve water and watershed governance issues by bridging jurisdictional and financial gaps, in Abell, R., et al. (2017). *Beyond the source: the environmental, economic and community benefits of source water protection.* Arlington, Virginia: The Nature Conservancy.

- Strengthen the responsibility of local authorities for water-use efficiency (Uzbekistan).

2. Improve the enabling environment for both horizontal integration (between economic sectors, such as agriculture, forestry, and urban and other land use) and vertical integration (from national to local) for effective communication, coordination and collaboration (Bulgaria, China, Guatemala).

3. Establish procedures for managing IWRM projects at central- and municipal-government levels (Guatemala).

4. Build capacity of sector institutions and relevant stakeholders to participate in water management (Guatemala, Ukraine, Mongolia, El Salvador, Cambodia, Burundi, Armenia).

5. Enhance coordination by establishing multisectoral forums as a coordination mechanism for implementation of river basin management plans; strengthen sharing of information, experiences and opinions between different sectors (Mongolia, Tanzania, Armenia, Burundi).

6. Invest in people: improve the recruitment procedures of state water management agencies to ensure qualified staff; develop staff capacity to fully equip them with skills needed to improve IWRM implementation (Armenia, Burundi); provide education and training to raise public awareness on the importance of water and water conservation (China).

7. Encourage participation of women in water resources management at national- and river-basin-management levels; increase the number of women decision makers (Mongolia, Armenia).

8. Strengthen arrangements for transboundary water management in priority basins (Mongolia, Armenia); build mutual trust (Tanzania).

9. Improve the participation of the private sector and all stakeholders in water resources development and planning (China, Kazakhstan, Armenia).

Management instruments

1. Establish effective mechanisms for the application of management instruments for institutional coordination, and for human and financial resources (El Salvador, Bulgaria, Guatemala, Tanzania).

2. Continue strengthening the capacities of staff and stakeholders on the application of management instruments at appropriate levels (Cambodia, Burundi, Guatemala, Kazakhstan, Mongolia).

3. Encourage and establish modalities for the private sector and civil society to collaborate with basin water administration offices to support priority areas in management of water resources (Tanzania).

4. Improve the communication and cooperation between scientists and experts from administration and business to apply new technologies that boost water efficiency (Bulgaria).

5. Increase the number of (automatic) monitoring stations; improve data management (Bulgaria, Burundi, Guatemala, Mongolia, Pakistan, Tanzania), and establish laboratories for control and monitoring of water quality (Burundi, Pakistan).

6. Establish a national water resources information system (DRC).

7. Establish data-sharing arrangements between significant data providers and users (Tanzania).

8. Protect ecosystems, watersheds, water reservoirs, buffer zones and water reservoirs (Burundi).

9. Establish a joint coordination structure for disaster management and early warning related to water; develop contingency plans (Burundi, Tanzania).

Financing

1. Introduce dedicated legislation on water sector financing (DRC); establish sustainable financing mechanisms and budget allocation for implementation of national IWRM and river basin management plans (Mongolia).

2. Promote, lobby and influence municipal governments and development councils to develop IWRM infrastructure projects (Guatemala); seek prioritization of water management and infrastructure in the national budget (Tanzania, Pakistan).

3. Develop an investment strategy for rehabilitation of water infrastructure (Ukraine).

4. Increase cost recovery for water-related services by applying realistic water pricing, and by collecting revenues systematically (Pakistan, Uzbekistan, Armenia, Mongolia, Guatemala, El Salvador, DRC); provide for water trading at different levels to contribute towards improving cost recovery (Pakistan).

5. Improve the coordination and synergy between financial (market-based) instruments and command-and-control instruments; improve implementation of financial instruments in the water sector (fees, taxes, sanctions, subsidies, etc.); improve enforcement of legislation (Bulgaria).

6. Promote public-private partnerships in water resources management (Tanzania, Pakistan).

6.4 NEXT STEPS FOR IMPLEMENTING WATER RESOURCES MANAGEMENT

The above country examples of actions to accelerate IWRM implementation can provide inspiration to others. Countries that have not yet identified action areas should now do so. In conjunction with this, most countries may now also wish to set national targets that consider the global aspirational targets but are in line with national contexts and priorities. The country reporting based on the survey instruments for SDG indicators 6.5.1 and 6.5.2 can serve as a platform for a dialogue between IWRM stakeholders to identify action areas and set national targets. Following this, the challenge for countries lies in designing, securing resources for, and implementing activities that will support action areas and will move towards targets.

The 2030 Agenda resolution encourages each Government to set "its own national targets guided by the global level of ambition but taking into account national circumstances."[61] Though the resolution encourages this approach, countries seeking to address the challenging task of setting national targets across the SDGs will find no fixed instructions. Some initiatives and examples may provide a starting point:

- The UN Development Group provides guidance and a toolkit on tailoring SDGs to national, subnational and local contexts.[62]
- Some countries are currently going through processes to set national targets for drinking water, sanitation and hygiene. A briefing note providing lessons learned and recommendations is in development.[63]
- The European regional protocol on water and health provides guidelines on national target setting and evaluation of progress.[64]
- The Framework for Freshwater Ecosystem Management provides a holistic framework, which includes advice on setting objectives and targets with a focus on ecosystem health for sustainable development.[65]

As a practical suggestion, countries could use multi-stakeholder processes to fill out the 6.5.1 survey with ambitious yet realistic target scores for individual questions.

These targets can be aggregated to provide an overall country target score. This approach could be used to set targets for 2030, as well as to set interim targets, if desired – as and beyond 2030, if required – to ultimately reach the very high IWRM implementation category.

International organizations can support national processes as requested. The reporting from countries on the core indicators for SDG-6, including indicator 6.5.1 on IWRM implementation, provides an excellent platform for a dialogue with and within countries on how to strengthen water resources management across sectors and stakeholders, and on how to identify specific needs for capacity development, technology transfer and piloting investments. This dialogue would also provide opportunities for a knowledge exchange between countries, and a more direct link to solution providers across the world.


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[61] United Nations (2015). *Transforming our world: the 2030 agenda for sustainable development*. Resolution adopted by the United Nations General Assembly on 25 September 2015. A/RES/70/1, 15-16301 (E). Paragraphs 54 – 59.

[62] United Nations Development Group. *Tailoring SDG to National, Subnational and Local Contexts*. https://undg.org/2030-agenda/mainstreaming-2030-agenda/tailoring-sdg-to-national-context/#Purpose%20,%20found%20via%20HOME%20%C2%BB%202030%20AGENDA%20%C2%BB%20MAINSTREAMING%202030%20AGENDA. Accessed 26 July 2018.

[63] For example, Rural Water Supply Network, WHO/UNICEF Joint Monitoring Programme webinar, *The SDGs at the national level: how countries nationalise targets and indicators*. https://vimeo.com/272921443. Accessed 26 July 2018.

[64] United Nations Economic Commission for Europe and the World Health Organization Regional Office for Europe (2010). *Guidelines on the setting of targets, evaluation of progress and reporting. Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes.*

[65] UN Environment (2017). *A framework for freshwater ecosystem management. Volume 1: Overview and country guide for implementation. Volume 2: Technical guide for classification and target-setting.* Nairobi.

6.5 KEY MESSAGES AND RECOMMENDATIONS

The following IWRM implementation categories are used in this baseline assessment:

Implementation Categories	Score range	General interpretation for overall IWRM score
Very high	91 - 100	Plans and programmes are reviewed and revised.
High	71 - 90	Most IWRM objectives are generally met.
Medium-high	51 - 70	Most IWRM elements are being implemented under long-term programmes.
Medium-low	31 - 50	IWRM elements are institutionalized, and implementation is underway.
Low	11 - 30	Some implementation of IWRM elements has begun.
Very low	0 - 10	Development of IWRM elements has generally not begun, or has stalled.

Implementing integrated water resources management for the 2030 Agenda

1. **Integrated approaches to water resources management help to coordinate sustainable development, and help to determine how water is managed across agriculture, urban uses and ecosystems: these approaches are hugely important for the full 2030 Agenda.** With increasing water scarcity and pollution, addressing conflicts and trade-offs is critical to allocate and use water in an efficient, sustainable and equitable manner. Recognizing the value of integrated approaches to water resources management at the political level is critical to achieving the 2030 Agenda.

Baseline status

2. **The vast majority (80 per cent) of countries have laid solid foundations for integrated water resources management:**

    - Some 40 per cent of countries have institutionalized most elements of IWRM (medium-low implementation). They now need to focus on implementation;
    - Another 20 per cent of countries are generally implementing most elements of IWRM in long-term programmes (medium-high implementation). They need to expand coverage and stakeholder engagement.
    - The top 20 per cent of countries are generally achieving their policy objectives for integrated water resources management (high and very high implementation).

The lowest 20 per cent have started the process. They need to prioritize activities that will have the greatest impact in the national context.

Progress towards the global target

3. **Under business-as-usual scenarios, most countries are unlikely to meet the global, aspirational target of very high implementation by 2030.**

    - The bottom 60 per cent of countries (medium-low implementation and below) are unlikely to reach the global target by 2030 unless implementation is significantly accelerated. These countries should set national, interim targets and prioritize activities which can have the greatest impact.
    - Another 20 per cent of countries (medium-high implementation) are potentially in a position to reach the global target, but efforts need to focus on, and to sustain momentum towards 2030.
    - Only the top 20 per cent of countries are likely to meet the global target. Most of these countries have very high levels of development.

Actions towards achieving target 6.5

4. Multi-stakeholder processes for completing the SDG indicator 6.5.1 survey have helped to identify challenge areas and actions in line with national priorities and planning processes across sectors. Unless more sophisticated national-level assessments and plans exist, all countries can learn from and build on the 6.5.1 reporting experience and make full use of the integrated (multi-stakeholder) approach to advance progress.

ANNEXES

A. 6.5.1 QUESTIONNAIRE

A.1 6.5.1 QUESTIONNAIRE OVERVIEW

Section 1: Enabling Environment. Assessment of Degree of implementation (0 – 100)	
1.1	**What is the status of policies, laws and plans to support IWRM at the national level?**
a	National water resources **policy,** or similar
b	National **water resources law(s)**
c	National **integrated water resources management** (IWRM) **plans**, or similar
1.2	**What is the status of policies, laws and plans to support IWRM at other levels?**
a	**Subnational** water resources **policies** or similar
b	**Basin/aquifer management plans** or similar, based on IWRM
c	**Arrangements for transboundary water management in most important basins / aquifers**
d	FEDERAL COUNTRIES ONLY: **Provincial/state water resources laws**
Section 2: Institutions and Participation. Assessment of Degree of implementation (0 – 100)	
2.1	**What is the status of institutions for IWRM implementation at the national level?**
a	National **government authorities' capacity** for leading implementation of national IWRM plans or similar
b	**Coordination between government authorities from different sectors** on water resources
c	**Public participation** in water resources, policy, planning and management at national level
d	**Business participation** in water resources development, management and use at national level
e	**Gender-specific objectives** for water resources management at national level
f	**Developing IWRM capacity** at the national level
2.2	**What is the status of institutions for IWRM implementation at other levels?**
a	**Basin/aquifer level organizations for leading implementation** of IWRM plans or similar
b	**Public participation** in water resources, policy, planning and management at the **local level**
c	**Gender**-specific objectives at **subnational levels**
d	**Gender**-specific objectives and plans **at transboundary** level
e	**Organizational framework for transboundary water management** for most important basins / aquifers
f	FEDERAL COUNTRIES ONLY: **Provincial / State authorities** responsible for water resources management
Section 3: Management Instruments. Assessment of Degree of implementation (0 – 100)	
3.1	**What is the status of management instruments to support IWRM implementation at the national level?**
a	**National monitoring of water availability** (includes surface and/or groundwater, as relevant to the country)
b	**Sustainable and efficient water-use management** from the national level
c	**Pollution control** from the national level
d	**Management of water-related ecosystems** from the national level
e	**Management instruments to reduce impacts of water-related disasters** from the national level
3.2	**What is the status of management instruments to support IWRM implementation at other levels?**
a	**Basin management instruments**
b	**Aquifer management instruments**
c	**Data and information sharing** within **countries** at all levels
d	**Transboundary data and information sharing** between **countries**
Section 4: Financing. Assessment of Degree of implementation (0 – 100)	
4.1	**What is the status of financing for water resources development and management at the national level?**
a	**National budget** for **investment** including water resources **infrastructure**
b	**National budget** for the **recurrent costs of** the **IWRM** elements
4.2	**What is the status of financing for water resources development and management at other levels?**
a	**Subnational or basin budgets** for investment including water resources **infrastructure**
b	**Revenues** raised from dedicated levies on water users at basin, aquifer or subnational levels
c	**Financing for transboundary cooperation**

A.2 6.5.1 QUESTIONNAIRE WITH THRESHOLD DESCRIPTIONS

The shortened version of the questionnaire below contains the full wording of the questions and the threshold descriptions. However, it does not contain the glossaries and explanatory notes contained in the full questionnaire, which can be downloaded from http://iwrmdataportal.unepdhi.org. The threshold descriptions are included here as they are useful for the interpretation of progress from each of the questions.

1. ENABLING ENVIRONMENT	Degree of implementation (0 – 100)					
	Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
1.1 What is the status of policies, laws and plans to support Integrated Water Resources Management (IWRM) at the national level?						
a. National water resources **policy,** or similar	Development **not started** or not progressing.	Exists, but **not based on IWRM**.	**Based on IWRM, approved** by government and **starting to be used** by authorities to guide work.	**Being used by the majority** of relevant authorities to guide work.	Policy **objectives consistently achieved.**	Objectives consistently achieved, and **periodically reviewed and revised**.
b. National **water resources law(s)**	Development **not started** or not progressing**.**	Exists, but **not based on IWRM**.	**Based on IWRM, approved by government** and **starting to be applied** by authorities.	**Being applied by the majority** of relevant authorities**.**	**All laws are being applied** across the country.	**All** laws are **enforced** across the country, and **all people and organizations** are **held accountable.**
c. National **integrated water resources management** (IWRM) **plans**, or similar	Development **not started** or not progressing**.**	**Being prepared**, but not approved by government.	**Approved** by government and **starting to be implemented** by authorities.	**Being implemented by the majority** of relevant authorities.	Plan **objectives consistently achieved**.	Objectives consistently achieved, and **periodically reviewed and revised.**
1.2 What is the status of policies, laws and plans to support IWRM at other levels?						
a. Subnational water resources **policies** or similar	**Development not started or delayed in most subnational jurisdictions**.	Exist in **most jurisdictions**, but **not necessarily based on IWRM**.	**Based on IWRM, approved by the majority of** authorities and starting to be used to guide work.	**Being used** by **the majority of relevant** authorities to guide work.	Policy objectives **consistently achieved by a majority of authorities**.	Objectives **consistently achieved by all** authorities, and **periodically reviewed and revised**.
b. Basin/aquifer management plans or similar, based on IWRM	**Development not started or delayed in most** basins/ aquifers of national importance.	**Being prepared for most** basins/aquifers of national importance.	**Approved in the majority** of basins/aquifers and starting to be used by authorities.	Being **implemented in the majority of** basins/ aquifers.	Plan **objectives consistently achieved in majority** of basins/ aquifers.	**Objectives consistently achieved in all basins**/ aquifers, and **periodically reviewed and revised**.

1. ENABLING ENVIRONMENT	Degree of implementation (0 – 100)					
	Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
c. Arrangements for transboundary water management in most important basins / aquifers	Development not started or not progressing.	**Being prepared or negotiated.**	**Arrangements are adopted**.	Arrangements' provisions are **partly implemented.**	**Most** of the arrangements' **provisions are implemented.**	The arrangements' provisions are **fully implemented.**
d. FEDERAL COUNTRIES ONLY: **Provincial/state water resources laws**.	**Development not started or delayed in most** states.	Exist in most jurisdictions, but not necessarily based on IWRM.	**Based on IWRM, approved in most states and starting to be applied by authorities** in the **minority** of states.	**Some laws** being applied in the **majority** of states.	**All laws** being applied in the **majority** of states.	**All laws** being applied in **all** states, and **all people and organizations** are **held accountable**.

2. INSTITUTIONS AND PARTICIPATION	Degree of implementation (0 – 100)					
	Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
2.1 What is the status of institutions for IWRM implementation at the national level?						
a. National **government authorities' capacity** for leading implementation of national IWRM plans or similar	**No dedicated government authorities** for water resources management.	Authorities exist, with **clear mandate to lead water resources management**.	Authorities have clear mandate to lead IWRM implementation, and the **capacity to effectively lead IWRM plan formulation**.	Authorities have the **capacity to effectively lead IWRM plan implementation**.	Authorities have the capacity to effectively lead **periodic monitoring and evaluation of the IWRM plan**.	Authorities have the capacity to effectively lead **periodic IWRM plan revision**.
b. **Coordination between** national **government authorities representing different sectors** on water resources, policy, planning and management	**No communication** between different government sectors on policy, planning and management.	**Communication: Information** on water resources, policy, planning and management **is made available between different sectors.**	**Consultation: Information, experiences and opinions are shared between different sectors.**	**Participation: Opportunities** for different sectors **to take part in** policy, planning and management **processes.**	**Representation: Formal consultation** between different government sectors **with the objective of agreeing on collective decisions on important issues and activities.**	**Co-decisions and co-production: Shared power between different sectors** on joint policy, planning and management activities.

2. INSTITUTIONS AND PARTICIPATION	Degree of implementation (0 – 100)					
	Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
c. **Public participation** in water resources, policy, planning and management at national level.	**No communication** between government and stakeholders on policy, planning and management.	**Communication: Information** on water resources, policy, planning and management **is made available to stakeholders.**	**Consultation:** Government authorities **occasionally request** information, experiences and opinions of stakeholders**.**	**Consultation:** Government authorities **regularly request** information, experiences and opinions of stakeholders.	**Participation:** Regular opportunities for stakeholders **to take part in relevant** policy, planning and management **processes.**	**Representation: Formal representation of** stakeholders in government processes **contributing to decision making on important issues and activities, as appropriate.**
d. **Business participation** in water resources development, management and use at national level.	**No communication** between government and business about water resources development, management and use.	**Limited communication** between government and business about water resources development, management and use.	**Regular consultation** between government and business about water resources development, management and use.	**Limited opportunities for** private sector involvement established for water resources development, management and use activities.	**Regular opportunities for private sector involvement** established for water resources development, management and use activities.	**Effective private sector involvement established** for water resources development, management and use activities.
e. **Gender-specific objectives** for water resources management at national level.	**Gender not explicitly addressed** throughout national laws, policy or plans.	**Gender partially addressed** throughout national laws, policies or plans.	**Gender addressed** in national plans but with **limited budget** and **implementation**.	Gender addressed in national plans, **partially funded** and **objectives partly achieved**.	Activities **adequately funded,** and **objectives mostly achieved**.	Objectives **fully achieved** and **adequately address gender issues**.
f. **Developing IWRM capacity** at the national level	**No capacity development specific to water resources management**.	**Occasional** capacity development, generally limited to **short-term / ad hoc activities**.	**Some long-term** capacity development initiatives are being implemented, but geographic and stakeholder **coverage is limited**.	**Long-term** capacity development initiatives are being implemented, and geographic and stakeholder **coverage is adequate**.	**Long-term** capacity development initiatives are being implemented, with **effective outcomes**, and geographic and stakeholder **coverage is very good**.	**Long-term** capacity development initiatives are being implemented with **highly effective outcomes**, and geographic and stakeholder **coverage is excellent.**
2.2 What is the status of institutions for IWRM implementation at other levels?						
a. **Basin/aquifer level organizations for leading implementation** of IWRM plans or similar.	**No dedicated basin authorities for water resources management.**	Authorities exist, with **clear mandate to lead water resources management**.	Authorities have clear mandate to lead IWRM implementation, and the **capacity to effectively lead** IWRM plan **formulation**.	Authorities have the **capacity to effectively lead** IWRM plan **implementation**.	Authorities have the **capacity to effectively lead periodic monitoring and evaluation** of the IWRM plan.	Authorities have the **capacity to effectively lead periodic IWRM plan revision**.

2. INSTITUTIONS AND PARTICIPATION	Degree of implementation (0 – 100)					
	Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
b. **Public participation** in water resources, policy, planning and management at the **local level**	**No communication** between local government and stakeholders on policy, planning and management.	**Communication: Local level information** on water resources, policy, planning and management **is made available to stakeholders.**	**Consultation:** Government authorities **occasionally request** local level information, experiences and opinions of stakeholders**.**	**Consultation:** Government authorities **regularly request** local level information, experiences and opinions of stakeholders.	**Participation:** Regular opportunities for stakeholders **to take part in relevant local level** policy, planning and management **processes.**	**Representation:** Formal representation of stakeholders on local authority processes contributing to decision-making on important local issues and activities, as appropriate.
c. **Gender**-specific objectives at **subnational levels**	**Gender not explicitly addressed** throughout subnational laws, policy or plans.	**Gender partially addressed** in subnational laws, policies or plans.	**Gender addressed** in subnational plans but with **limited budget** and **implementation**.	Gender addressed in subnational plans, **partially funded** and **objectives partly achieved**.	Activities **adequately funded,** and **objectives mostly achieved**.	Objectives **fully achieved** and **adequately address subnational gender issues**.
d. **Gender**-specific objectives and plans **at transboundary** level	**Gender not explicitly addressed** in transboundary policies or plans.	**Gender partially addressed** in transboundary policies or plans.	**Gender addressed** in transboundary plans but with **limited budget** and **implementation**.	Gender addressed in transboundary plans, **partially funded** and **objectives partly achieved**.	Activities **adequately funded,** and **objectives mostly achieved**.	Objectives **fully achieved** and **adequately address transboundary gender issues**.
e. **Organizational framework for transboundary water management** for most important basins / aquifers	No organizational framework(s).	Organizational framework(s) **being developed**.	Organizational framework(s) **established**.	Organizational framework(s)' **mandate is partly fulfilled**.	Organizational framework(s)' **mandate is fulfilled for the most part.**	Organizational framework(s)' **mandate is fully fulfilled.**
f. FEDERAL COUNTRIES ONLY: **Provincial / State authorities** responsible for water resources management	**No dedicated provincial/state authorities for water resources management.**	Authorities exist, with **clear mandate to lead water resources management**.	Authorities have clear mandate to lead IWRM implementation, and the **capacity** to effectively lead IWRM **plan formulation**.	Authorities have the **capacity** to effectively lead IWRM **plan implementation**.	Authorities have the capacity to effectively lead **periodic monitoring and evaluation** of the IWRM plan.	Authorities have the capacity to effectively lead **periodic** IWRM plan **revision**.

3. MANAGEMENT INSTRUMENTS		Degree of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
3.1 What is the status of management instruments to support IWRM implementation at the national level?							
a	**National monitoring of water availability** (includes surface and/or groundwater, as relevant to the country).	No national monitoring systems in place.	Monitoring systems established for a limited number of **short-term / ad hoc projects** or similar.	**Long-term** national monitoring is carried out but with **limited coverage and limited use** by stakeholders.	**Long-term** national monitoring is carried out with **adequate coverage but limited use** by stakeholders.	**Long-term** national monitoring is carried out with **very good coverage and adequate use** by stakeholders.	**Long-term** national monitoring is carried out with **excellent coverage and excellent use** by stakeholders.
b	**Sustainable and efficient water-use management** from the national level, (includes surface and/or groundwater, as relevant to the country).	No management instruments being implemented.	Use of management instruments is **limited** and only through **short-term / ad hoc projects** or similar.	**Some** management instruments implemented on a more **long-term** basis, but with **limited coverage** across different water users and the country.	Management instruments are implemented on a long-term basis, with **adequate coverage** across different water users and the country.	Management instruments are implemented on a long-term basis, with **very good coverage** across different water users and the country, and are **effective**.	Management instruments are implemented on a long-term basis, with **excellent coverage** across different water users and the country, and are **highly effective**.
c	**Pollution control** from the national level	No management instruments being implemented.	Use of management instruments is **limited** and only through **short-term / ad hoc projects** or similar.	**Some** management instruments implemented on a more **long-term** basis, but with **limited coverage** across sectors and the country.	Management instruments are implemented on a long-term basis, with **adequate coverage** across sectors and the country.	Management instruments are implemented on a long-term basis, with **very good coverage** across sectors and the country, and are **effective**.	Management instruments are implemented on a long-term basis, with **excellent coverage** across sectors and the country, and are **highly effective**.
d	**Management of water-related ecosystems** from the national level	No management instruments being implemented.	Use of management instruments is **limited** and only through **short-term / ad hoc projects** or similar.	**Some** management instruments implemented on a more **long-term** basis, but with **limited coverage** across different ecosystem types and the country.	Management instruments are implemented on a long-term basis, with **adequate coverage** across different ecosystem types and the country. Environmental Water Requirements (EWR) analysed in some cases.	Management instruments are implemented on a long-term basis, with **very good coverage** across different ecosystem types and the country, and are **effective**. EWR analysed for most of country.	Management instruments are implemented on a long-term basis, with **excellent coverage** across different ecosystem types and the country, and are **highly effective**. EWR analysed for whole country.

3. MANAGEMENT INSTRUMENTS		Degree of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
e	**Management instruments to reduce impacts of water-related disasters** from the national level	No management instruments being implemented.	Use of management instruments is **limited** and only through **short-term / ad hoc projects** or similar.	**Some** management instruments implemented on a more **long-term** basis, but with **limited coverage** of at-risk areas.	Management instruments are implemented on a long-term basis, with **adequate coverage** of at-risk areas.	Management instruments are implemented on a long-term basis, with **very good coverage** of at-risk areas, and are **effective**.	Management instruments are implemented on a long-term basis, with **excellent coverage** of at-risk areas, and are **highly effective**.
3.2 What is the status of management instruments to support IWRM implementation at other levels?							
a	**Basin management instruments**.	No basin level management instruments being implemented.	Use of basin level management instruments is **limited** and only through **short-term / ad hoc projects**.	**Some** basin level management instruments implemented on a more **long-term** basis, but with **limited geographic and stakeholder coverage**.	Basin level management instruments implemented on a more **long-term** basis, with **adequate geographic and stakeholder coverage**.	Basin level management instruments implemented on a more **long-term** basis, with **effective outcomes** and **very good geographic and stakeholder coverage**.	Basin level management instruments implemented on a more **long-term** basis, with **highly effective outcomes** and **excellent geographic and stakeholder coverage**.
b	**Aquifer management instruments**.	No aquifer level management instruments being implemented.	Use of aquifer level management instruments is **limited** and only through **short-term / ad hoc projects**.	**Some** aquifer level management instruments implemented on a more **long-term** basis, but with **limited geographic and stakeholder coverage**.	Aquifer level management instruments implemented on a more **long-term** basis, with **adequate geographic and stakeholder coverage**.	Aquifer level management instruments implemented on a more **long-term** basis, with **effective outcomes** and **very good geographic and stakeholder coverage**.	Aquifer level management instruments implemented on a more **long-term** basis, with **highly effective outcomes** and **excellent geographic and stakeholder coverage**.
c	**Data and information sharing** within **countries** at all levels	No data and information sharing.	**Limited** data and information sharing **on an ad hoc basis.**	Data and information sharing **arrangements exist** on a more **long-term basis between major data providers and users.**	Data and information sharing **arrangements implemented** on a more **long-term basis,** with **adequate coverage** across sectors and the country.	Data and information sharing **arrangements implemented** on a more **long-term basis,** with **very good coverage** across sectors and the country.	**All relevant data and information are online and freely accessible to all**.

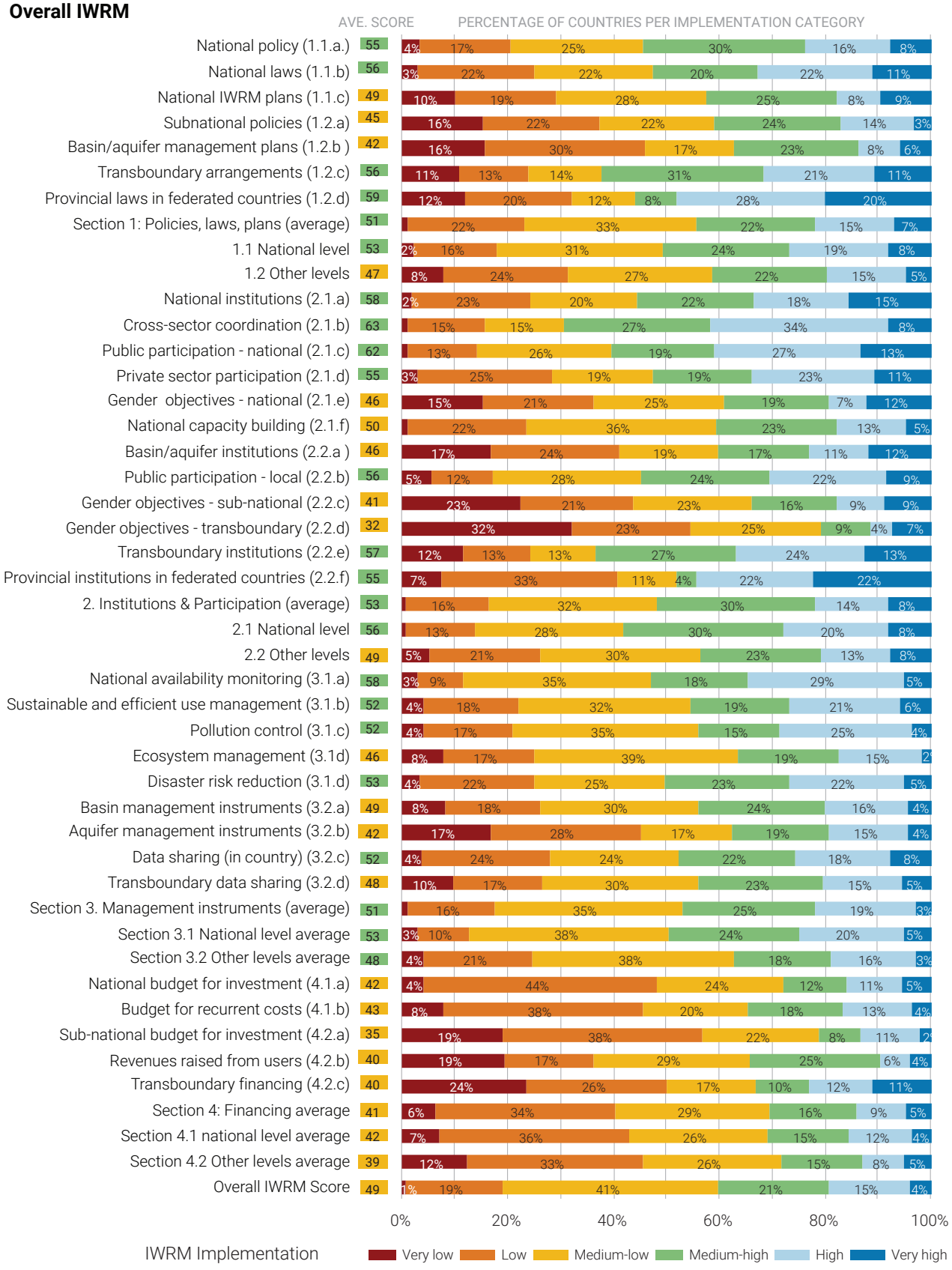
3. MANAGEMENT INSTRUMENTS		Degree of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
d	**Transboundary data and information sharing** between **countries**	No data and information sharing.	**Limited** data and information sharing **on an ad hoc or informal basis.**	Data and information sharing **arrangements exist, but sharing is limited.**	Data and information sharing **arrangements implemented adequately.**	Data and information sharing **arrangements implemented effectively.**	All relevant data and information are **online** and **accessible between countries**.

4. FINANCING		Degree of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
4.1 What is the status of financing for water resources development and management at the national level?							
a	**National budget** for **investment** including water resources **infrastructure**.	**No budget** allocated in national investment plans.	**Budget allocated** but only partly covers planned investments.	**Sufficient budget allocated** for planned investments but insufficient funds disbursed or made **available.**	**Sufficient budget allocated and funds disbursed** for all planned programmes or projects.	**Funding available and all planned projects under implementation**.	Planned programmes **completed,** post-evaluation carried out and new funding cycle for programmes underway.
b	**National budget** for the **recurrent costs of** the **IWRM** elements	**No budget** allocations made for recurrent costs of the IWRM elements.	**Allocations** made for **only a few** of the elements and implementation at an early stage.	Allocations made for **at least half** of the elements but insufficient for others.	Allocations for **most of the elements** and some implementation under way.	Allocations include **all elements** and implementation regularly carried out.	Planned budget allocations for all elements of the IWRM approach **fully utilized**.
4.2 What is the status of financing for water resources development and management at other levels?							
a	**Subnational or basin budgets** for investment including water resources **infrastructure**.	**No** budget allocated In subnational or basin investment plans.	**Budget allocated** but only partly covers planned investments.	**Sufficient budget allocated** for planned investments but insufficient funds disbursed or made **available**.	Sufficient budget allocated and funds disbursed for all planned programmes or projects.	Funding available and all **planned projects under implementation.**	**Budget fully utilized**, programmes completed as planned and post evaluation carried out.

4. FINANCING		Degree of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
b	**Revenues** raised from dedicated levies on water users at basin, aquifer or subnational levels.	**No revenues** raised at the **subnational** level.	**Processes in place** to raise local revenue but **not yet implemented**.	Limited revenues raised from **charges, but are not** used for IWRM activities.	Limited revenues raised from **charges** cover some IWRM activities.	Revenues raised from **charges** cover most IWRM activities.	Local authorities raise funds **from multiple sources and fully cover costs** of IWRM activities.
c	**Financing for transboundary cooperation**	No specific funding allocated from the MS budgets nor from other regular sources.	MS agreement on country share of contributions in place and in-kind support for the cooperation organization / arrangement.	Funding less than 50% of that expected as contributions and by regulation.	Funding less than 75% of that expected as contributions and by regulation.	Funding more than 75% of that expected as contributions and by regulation.	Full funding of that expected as contributions and by regulation.

B. GLOBAL DISTRIBUTION OF IWRM IMPLEMENTATION BY QUESTION

Overall IWRM



C. NATIONAL 6.5.1 DATA: IWRM IMPLEMENTATION

IWRM implementation categories and score thresholds

Very low	Low	Medium-low	Medium-high	High	Very high
0 - 10	11 - 30	31 - 50	51 - 70	71 - 90	91 - 100

Scores based on 33 questions across four sections (see Annex A). For full results for each question for each country, see http://iwrmdataportal.unepdhi.org

A number of measures have been implemented to address objectivity, transparency, and comparability of the survey results (see section 2.2 of the main report). However, it is acknowledged that there is still an element of subjectivity in the country responses, particularly in countries where multi-stakeholder processes were less extensive. Ultimately, while results are indicative and country-driven,[66] the self-assessed country reporting is designed to be useful to the countries to furthering IWRM implementation. Therefore, rather than comparing scores between countries, the more important issue is what countries do with the information, and how IWRM implementation is advanced over time. At the national level, the surveys can be used as a relatively simple diagnostic tool to identify areas of relatively low or high IWRM implementation. Globally, while it is acknowledged that there may be some deviation (or subjectivity) in individual data points (country scores), a useful pattern still emerges from 172 data points on the global status of IWRM implementation.

Country	ISO codes	Final IWRM Score	Section 1	Section 2	Section 3	Section 4
			Average	Average	Average	Average
			Enabling environment	Institutions and participation	Management instruments	Financing
Afghanistan	AFG	**12**	23	12	9	2
Albania	ALB	**43**	40	65	51	16
Algeria	DZA	**48**	40	42	51	60
Andorra	AND	**36**	23	41	43	35
Angola	AGO	**37**	45	38	38	28
Antigua and Barbuda	ATG	**30**	32	33	40	15
Argentina	ARG	**38**	39	48	34	32
Armenia	ARM	**36**	42	40	28	34
Australia	AUS	**86**	83	88	88	83
Austria	AUT	**91**	100	95	100	70
Azerbaijan	AZE	**66**	55	59	72	78
Bahamas	BHS	**33**	34	31	36	33
Bahrain	BHR	**40**	28	48	43	40
Bangladesh	BGD	**50**	50	49	56	45
Barbados	BRB	**42**	30	48	59	30
Belarus	BLR	**38**	36	35	58	24

[66] See Annex G – Quality Control Process, especially point 7 and footnotes.

Country	ISO codes	Final IWRM Score	Section 1	Section 2	Section 3	Section 4
			Average	Average	Average	Average
			Enabling environment	Institutions and participation	Management instruments	Financing
Belgium	BEL	78	83	94	78	55
Belize	BLZ	20	28	26	18	8
Benin	BEN	63	70	71	62	48
Bhutan	BTN	32	36	24	38	32
Bolivia (Plurinational State of)	BOL	49	60	49	44	44
Bosnia and Herzegovina	BIH	61	66	62	62	53
Botswana	BWA	41	48	47	49	20
Brazil	BRA	51	60	64	44	34
Bulgaria	BGR	60	62	65	62	52
Burkina Faso	BFA	63	73	80	49	48
Burundi	BDI	32	40	31	33	24
Cambodia	KHM	46	54	46	50	32
Cameroon	CMR	34	30	33	37	36
Cape Verde	CPV	64	76	70	41	70
Central African Republic	CAF	31	50	42	12	20
Chad	TCD	32	35	36	30	26
Chile	CHL	23	18	26	19	28
China	CHN	75	75	75	76	72
Colombia	COL	50	55	55	53	38
Comoros	COM	26	27	35	14	28
Congo	COG	32	35	32	33	28
Costa Rica	CRI	43	30	44	51	48
Côte d'Ivoire	CIV	32	35	37	32	24
Croatia	HRV	90	97	98	84	80
Cuba	CUB	80	70	91	80	80
Cyprus	CYP	91	100	91	85	87
Czech Republic	CZE	79	88	83	82	64
Democratic People's Republic of Korea	PRK	38	35	54	44	20
Democratic Republic of the Congo	COD	31	27	44	29	26
Denmark	DNK	93	92	94	94	93
Dominica	DMA	40	18	61	56	25

Country	ISO codes	Final IWRM Score	Section 1	Section 2	Section 3	Section 4
			Average	Average	Average	Average
			Enabling environment	Institutions and participation	Management instruments	Financing
Dominican Republic	DOM	36	32	50	44	16
Ecuador	ECU	42	38	44	51	34
Egypt	EGY	40	47	42	49	24
El Salvador	SLV	21	20	25	28	12
Equatorial Guinea	GNQ	24	40	33	0	24
Estonia	EST	80	83	93	80	64
Ethiopia	ETH	31	40	38	28	20
Finland	FIN	75	88	79	77	55
France	FRA	100	100	100	100	100
Gabon	GAB	14	6	28	16	8
Gambia	GMB	30	34	36	33	16
Georgia	GEO	35	36	48	32	24
Germany	DEU	88	96	89	83	84
Ghana	GHA	49	56	55	40	44
Greece	GRC	83	87	86	77	N/A
Grenada	GRD	25	24	31	40	5
Guatemala	GTM	25	28	36	19	16
Guinea	GIN	24	13	25	27	32
Guyana	GUY	16	15	6	21	20
Haiti	HTI	29	27	38	28	25
Honduras	HND	21	20	24	22	16
Hungary	HUN	73	77	81	76	60
Iceland	ISL	52	28	70	75	35
Indonesia	IND	48	52	53	52	36
Iran (Islamic Republic of)	IRN	59	73	66	54	42
Iraq	IRQ	25	24	22	42	12
Ireland	IRL	81	80	84	82	76
Israel	ISR	85	83	83	82	93
Italy	ITA	55	60	61	51	46
Jamaica	JAM	43	32	42	65	33
Japan	JPN	94	100	96	90	90
Jordan	JOR	63	68	57	70	58

Country	ISO codes	Final IWRM Score	Section 1	Section 2	Section 3	Section 4
			Average	Average	Average	Average
			Enabling environment	Institutions and participation	Management instruments	Financing
Kazakhstan	KAZ	30	29	24	40	28
Kenya	KEN	53	63	59	48	40
Kuwait	KWT	82	84	82	80	80
Latvia	LVA	64	72	72	69	44
Lebanon	LBN	32	37	40	40	12
Lesotho	LSO	33	47	44	33	8
Liberia	LBR	15	17	18	13	12
Libyan Arab Jamahiriya	LBY	47	57	45	53	32
Liechtenstein	LIE	70	68	63	73	75
Lithuania	LTU	57	64	46	62	54
Luxembourg	LUX	90	88	96	92	85
Madagascar	MDG	36	40	33	63	10
Malawi	MWI	40	40	51	42	28
Malaysia	MYS	43	46	47	47	32
Maldives	MDV	35	40	53	29	20
Mali	MLI	53	58	60	59	36
Malta	MLT	75	87	73	76	65
Marshall Islands	MHL	33	40	32	45	13
Mauritania	MRT	45	53	51	33	44
Mauritius	MUS	64	65	63	60	70
Mexico	MEX	49	66	51	53	28
Micronesia (Federated States of)	FSM	38	42	51	33	28
Monaco	MCO	90	98	87	81	95
Mongolia	MNG	43	50	42	42	38
Montenegro	MNE	34	50	28	40	20
Morocco	MAR	64	68	69	64	55
Mozambique	MOZ	55	62	75	42	40
Myanmar	MMR	27	17	21	27	45
Namibia	NAM	59	58	63	59	57
Nepal	NPL	33	23	49	27	33
Netherlands	NLD	93	95	96	88	94
New Zealand	NZL	58	66	46	59	60

Country	ISO codes	Final IWRM Score	Section 1	Section 2	Section 3	Section 4
			Average	Average	Average	Average
			Enabling environment	Institutions and participation	Management instruments	Financing
Niger	NER	50	40	64	51	44
Nigeria	NGA	35	34	38	34	34
Norway	NOR	63	58	65	64	66
Oman	OMN	33	33	18	57	24
Pakistan	PAK	50	67	51	41	40
Panama	PAN	37	30	35	42	40
Papua New Guinea	PNG	25	27	23	20	30
Paraguay	PRY	32	33	36	38	20
Peru	PER	30	34	26	34	24
Philippines	PHL	51	64	53	52	37
Poland	POL	40	50	40	40	28
Portugal	PRT	74	76	83	78	60
Qatar	QAT	82	55	100	89	85
Republic of Korea	KOR	68	44	70	80	78
Republic of Moldova	MDA	32	43	33	31	20
Romania	ROU	72	96	65	84	44
Russian Federation	RUS	79	86	70	84	76
Rwanda	RWA	35	47	31	33	28
Saint Kitts and Nevis	KNA	22	15	20	33	20
Saint Lucia	LCA	40	30	64	44	23
Samoa	WSM	70	73	69	70	68
San Marino	SMR	66	67	60	68	70
Sao Tome and Principe	STP	23	24	22	25	20
Saudi Arabia	SAU	57	42	68	71	46
Senegal	SEN	53	60	66	49	38
Serbia	SRB	30	33	25	37	24
Seychelles	SYC	45	43	55	58	25
Sierra Leone	SLE	19	20	25	20	10
Singapore	SGP	100	100	100	100	100
Slovakia	SVK	66	68	76	66	54
Slovenia	SVN	58	58	55	62	56
Solomon Islands	SLB	26	25	28	30	20

Country	ISO codes	Final IWRM Score	Section 1	Section 2	Section 3	Section 4
			Average	Average	Average	Average
			Enabling environment	Institutions and participation	Management instruments	Financing
Somalia	SOM	10	13	13	11	4
South Africa	ZAF	65	77	64	66	56
South Sudan	SSD	38	46	47	33	28
Spain	ESP	82	93	81	90	66
Sri Lanka	LKA	25	16	36	26	23
Sudan	SDN	40	37	44	44	34
Suriname	SUR	15	16	11	23	10
Swaziland	SWZ	53	65	69	52	24
Sweden	SWE	89	76	91	87	100
Switzerland	CHE	81	71	79	81	94
The former Yugoslav Republic of Macedonia	MKD	22	27	20	27	16
Timor-Leste	TLS	14	4	21	21	10
Togo	TGO	32	40	28	36	24
Tonga	TON	30	28	53	38	0
Trinidad and Tobago	TTO	25	26	29	33	13
Tunisia	TUN	55	67	53	58	40
Turkey	TUR	70	75	75	70	58
Tuvalu	TUV	47	25	73	45	45
Uganda	UGA	59	63	69	62	40
Ukraine	UKR	39	35	49	40	32
United Arab Emirates	ARE	75	59	90	71	80
United Kingdom of Great Britain and Northern Ireland	GBR	77	83	82	76	66
United Republic of Tanzania	TZA	50	57	55	40	50
Uzbekistan	UZB	45	38	53	56	34
Vanuatu	VUT	39	36	64	38	18
Viet Nam	VNM	38	47	35	36	34
Yemen	YEM	39	50	51	36	20
Zambia	ZMB	46	48	65	36	36
Zimbabwe	ZWE	61	72	65	54	52

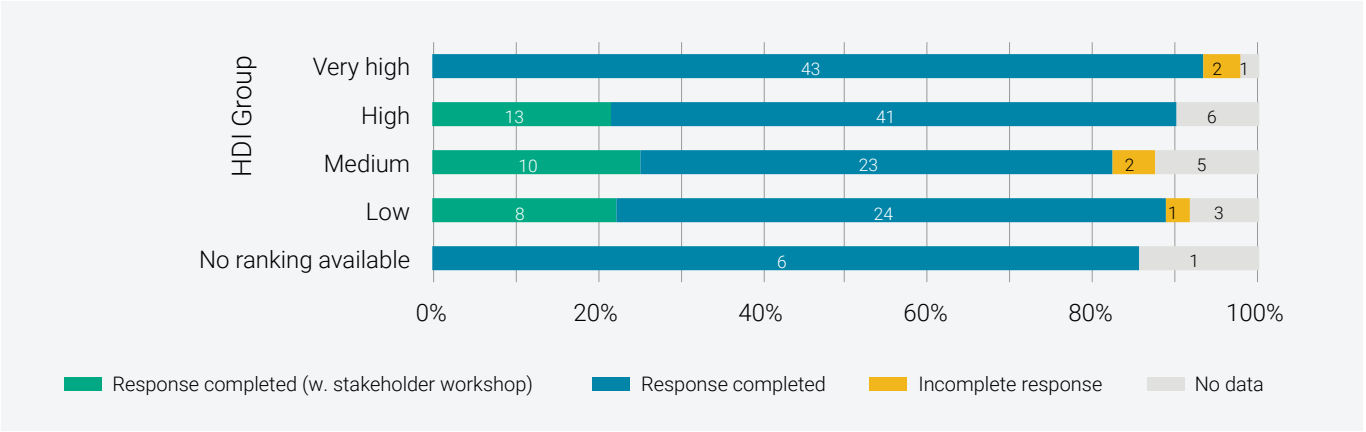
D. DATA COVERAGE AND BREAKDOWNS

A total of 172 countries (89 per cent) reported on the baseline for SDG indicator 6.5.1 (as described in Section 2.3 of the main report). The 21 countries that did not report, or submitted incomplete reports, are listed below.

Incomplete submission	No submission		
Brunei Darussalam	Canada	Lao People's Democratic Republic	Thailand
Djibouti	Eritrea	Nauru	Turkmenistan
Kiribati	Fiji	Nicaragua	Uruguay
Tajikistan	Guinea-Bissau	Palau	Venezuela (Bolivarian Republic of)
United States of America	India	Saint Vincent and the Grenadines	
	Kyrgyzstan	Syrian Arab Republic	

The countries listed above are from a range of regions, sizes, and levels of development (see also figure below). As such, their omission from the baseline reporting is not expected to have significant impacts on the global findings in this report. A number of these countries started completing the survey. Reasons provided by countries for not completing the survey include: lack of capacity (e.g. Guinea-Bissau, Venezuela), that the indicator was not high priority (e.g. Kyrgyzstan), or simply running out of time (e.g. Fiji, Uruguay), for reporting on indicator 6.5.1. Some federated countries (e.g. India, Canada, and USA) reported challenges to filling out the survey, including the complex arrangements required for data collection and reporting and lack of assigned responsible entity for reporting.

Country representation by HDI group
(number of countries in bar labels, percentage of countries along x-axis)



E. DEVELOPMENT OF THE 6.5.1 INDICATOR METHODOLOGY

E.1 METHODOLOGY DEVELOPMENT TO DATE

While this is a "new" indicator for the SDG period, the development of the methodology has a long history. The approach builds on global status reporting on the application of integrated approaches to water resources management in 2008 and 2012.[67] The 2008 report covered 104 countries, and the 2012 report covered 133 countries,[68] showing high levels of engagement from countries, and providing extensive experience on the monitoring approach.

The main considerations for developing the indicator 6.5.1 methodology, were to:

- Create a single indicator score: all SDG indicators were required to have a single indicator value, to be able to track progress against the targets. This contrasted with reporting in 2008 and 2012, which reported on various aspects of integrated water resources management, but made no attempt to aggregate them to a single score.
- Balance between level of detail and reducing reporting burden on countries: acknowledging that countries would be reporting on 169 targets, efforts were made to reduce the number of questions in the survey (from over 100 in 2012 to 33 in 2017), whilst still capturing the main elements of IWRM.
- Improve objectivity, transparency and comparability in responses: this was addressed in four main ways:
    - Introduction of threshold descriptions: in the 2012 survey, there were five possible common responses to each question, with the following thresholds: Under development; Developed but implementation not yet started; Implementation started; Implementation advanced; Fully implemented. In the 6.5.1 survey, unique and detailed descriptions were provided for six thresholds for each question.
    - Increasing the number of possible responses: from five in 2012 to eleven in 2017, with possible scores of zero to 100 in increments of 10 (and threshold descriptions for the scores of 0, 20, 40, 60, 80 and 100). The greater number of gradations of implementation allows countries to better track progress over time.
    - Introduction of free-text fields for each question: countries were encouraged to provide justification or evidence for the scores provided for each question.
    - Encouraging multi-stakeholder reporting processes (see Annex F).

Work on indicator development began in August 2014, with the establishment of a Task Team with representatives across UN agencies and partners. A series of drafting and review processes occurred over the next two years, with online and physical meetings. It included a workshop in November 2015, involving country representatives from Pakistan and Estonia. Pilot testing of the 6.5.1 survey was held in five countries (Jordan, the Netherlands, Peru, Senegal and Uganda), in collaboration with the UN-Water integrated monitoring initiative (GEMI). Additional feedback was received from Armenia, Indonesia and Trinidad and Tobago. The methodology was finalized in January 2017.[69]

E.2 FUTURE REVIEW OF METHODOLOGY

Following the baseline monitoring and reporting process, a period of review and revision is expected for both the indicator methodology and monitoring process. This is likely to include an analysis of whether the key elements of IWRM are included in the survey, any questions or thresholds that need clarifying, and making the in-country data collection processes more participatory and robust. The review will include national focal points, regional and global organizations, and the 6.5.1 indicator team and partners. Any changes to the methodology should consider impacts on comparability to this baseline assessment.

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[67] These reports were prepared at the request of the UN Commission on Sustainable Development:
UN-Water 2008. Status Report on Integrated Water Resources Management and Water Efficiency Plans. Prepared for the 16th session of the Commission on Sus tainable Development.
UNEP 2012. The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management.

[68] Compared to 172 countries in 2017/18 for the SDG baseline.

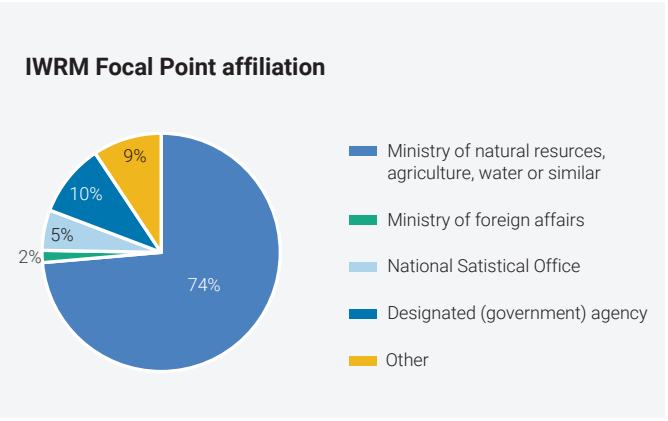
[69] The 2017 6.5.1 survey and step-by-step methodology can be downloaded from the IWRM data portal http://iwrmdataportal.unepdhi.org

F. NATIONAL WORKSHOP PROCESSES FOR DATA COLLECTION

Webinars and step-by-step indicator guidelines were available in six languages (Arabic, Chinese, English, French, Spanish, and Russian)[70] to provide national focal points with the knowledge needed to coordinate national processes to produce high quality data. All national focal points were encouraged to design multi-stakeholder processes, as appropriate in the national context and as resources allowed, to fill out the survey. Multi-stakeholder processes were supported by Global Water Partnership (GWP) via their national and regional partnerships, and the UN Environment - DHI Centre, and UN Environment in 36 countries (table below). The workshops were facilitated by GWP country water partnerships, in collaboration with national Focal Points. The main criteria for selection of workshop countries was country interest in receiving such support, as well as presence of country water partnerships to facilitate the workshops.[71]

Brief workshop reports were submitted from 31 countries, following a common template.[73] The workshop reports included: the completed country questionnaires and final 6.5.1 score (one per country), participants covering a range of stakeholder groups, discussions and differences in views for scores for each question, any major barriers to implementation, and priorities for further implementation. The breakdown of participants in each workshop is available on request. To keep reporting requirements to a minimum, focal points from the remaining countries were not asked to report on the actual processes used. Nevertheless, through anecdotal evidence available from correspondence with focal points, it is estimated that the vast majority of countries at least consulted across government departments to fill out the survey. In future review of the data-collection process, it is advised that keeping a record of the country processes is considered.

A summary of focal point affiliation is provided in the below figure. Focal point contact details are available on request.



Angola	Congo	Malaysia	Slovenia
Argentina	Democratic Republic of the Congo	Mauritania	South Africa
Armenia	El Salvador	Mongolia	Sudan
Bulgaria	Ethiopia	Mozambique	Tanzania
Burundi	Gambia	Niger	Ukraine
Cambodia	Guatemala	Pakistan	Uruguay[72]
Cameroon	Honduras	Philippines	Uzbekistan
Chile	Kazakhstan	Sao Tome and Principe	Zambia
China	Malawi	Slovakia	Zimbabwe

[70] http://iwrmdataportal.unepdhi.org

[71] Guidance for the design of the country workshops can be downloaded here: http://iwrmdataportal.unepdhi.org

[72] While Uruguay completed the workshop, the report was not submitted in time to be included in this baseline report.

[73] http://iwrmdataportal.unepdhi.org

G. QUALITY CONTROL PROCESS FOR DATA COLLECTION

Quality Assurance steps undertaken for SDG indicator 6.5.1 country submissions

1. **Focal point:** Cross-check if the person submitting is the formal national focal point as nominated or confirmed by country. Submission from substitute is acceptable if the national focal point (FP) is included in CC.

2. **Question responses: Check that:**
   a. **All questions are answered** – i.e. all questions should be answered (either with a score or n/a). Acceptable corrections include: a) for questions for 'federal countries' only (1.2d and 2.2f), and if not a federal country, can correct from blank to n/a; b) for transboundary questions, if country is an island state, can correct from blank to n/a. Always send no-objection email to country to notify of manual adjustments made.
   b. **Scores are in range from 0-100, in increments of 10.** If only 'even' scores (e.g. 0, 20, 40 etc.) are given verify that FP has understood the guidelines that 'odd' scores (10, 30, 50 etc.) are also possible.
   c. **Check that n/a (not applicable) is used appropriately.** i.e. only if the question is not applicable to the country. Where N/A is given for no obvious reasons, inquire justification field (e.g. if N/A response added to gender-related questions). Update the justification or change to 0, or a score, as appropriate in dialogue with FP.

3. **Justification/evidence fields:**
   a. Check that the free text responses are appropriate explanations in the context of the score (and vice versa). In case of significant discrepancies, consider asking the country to revise either the score or the free text.
   b. Special attention should be given to responses scored as N/A, 0 or 100, where countries should be encouraged to provide justification at all times.

4. **Calculations:** Check that section averages are calculated correctly, and that the final score is calculated correctly. Acceptable manual corrections include adjustments to section average scores, that do not affect the final score (always no objection notification to countries). For larger deviations and adjustments in final score, suggest countries make corrections and re-submit.

5. **General comparison with the national 2011 global IWRM survey response:** Flag major deviations and discuss with team as necessary, if final scores are considerably lower or higher than previous global survey results. May enquire for further justifications and verifications from countries on an ad hoc basis.

6. **Transboundary issues:**
   a. Check that countries have completed 'transboundary basins' table in the introductory section. A full list of transboundary basins can be found here: http://twap-rivers.org/indicators/Report.ashx?type=IndicatorResultsSummary. Maps can be accessed via http://twap-rivers.org/indicators/ for verification on whether the basin is likely to be important for that country, or if there is only a small portion of the basin in their country (in which case acceptable that basin is not listed as one of the most important basins).
   b. Check the transboundary questions: 1.2c; 2.2d; 2.2e; 3.2d; and 4.2c, and see if these make sense in the context of the country. Island states (without land borders) should score N/A for all of these questions.

7. **Cross-checking / validation of country responses:**
   a. In case of any of the above criteria not being met, a dialogue should be initiated with the FP to address such issues.[74]
   b. Where country responses satisfy the above criteria, the scores are to be accepted as country judgement, and should not be interrogated further.[75]

[74] In some cases, for example where insufficient justification was given for a score of 100 or 'n/a', and the Focal Point was asked to reconsider the response, there was either no response, or they declined to revise their response. In these cases, the original responses were still accepted and included in this report, as the benefits of including the results in the baseline reporting were deemed to outweigh any disadvantages of excluding the results.

[75] After data submission and drafting of this report, some reviewers have asked whether the quality control process could be made more rigorous, including cross-checking of certain responses. This may be considered in a review of the data-collection process, though the best way of ensuring more robust or realistic responses is to encourage countries to engage in a multi-stakeholder process to review and finalize their country responses. Countries that did this in baseline reporting reported that initial draft responses were often revised to the satisfaction of the majority of stakeholders.

NOTES

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LEARN MORE ABOUT PROGRESS TOWARDS SDG 6

6 CLEAN WATER AND SANITATION

SDG 6 expands the MDG focus on drinking water and basic sanitation to include the more holistic management of water, wastewater and ecosystem resources, acknowledging the importance of an enabling environment. Bringing these aspects together is an initial step towards addressing sector fragmentation and enabling coherent and sustainable management. It is also a major step towards a sustainable water future.

The monitoring of progress towards SDG 6 is a means to making this happen. High-quality data help policy- and decision makers at all levels of government to identify challenges and opportunities, to set priorities for more effective and efficient implementation, to communicate progress and ensure accountability, and to generate political, public and private sector support for further investment.

In 2016–2018, following the adoption of the global indicator framework, the UN-Water Integrated Monitoring Initiative focused on establishing the global baseline for all SDG 6 global indicators, which is essential for effective follow-up and review of progress towards SDG 6. Below is an overview of the resultant indicator reports produced in 2017–2018. UN-Water has also produced the SDG 6 Synthesis Report 2018 on Water and Sanitation, which, building on baseline data, addresses the cross-cutting nature of water and sanitation and the many interlinkages within SDG 6 and across the 2030 Agenda, and discusses ways to accelerate progress towards SDG 6.

Progress on Drinking Water, Sanitation and Hygiene – 2017 Update and SDG Baselines (including data on SDG indicators 6.1.1 and 6.2.1) By WHO and UNICEF	One of the most important uses of water is for drinking and hygiene purposes. A safely managed sanitation chain is essential to protecting the health of individuals and communities and the environment. By monitoring use of drinking water and sanitation services, policy- and decision makers can find out who has access to safe water and a toilet with handwashing facilities at home, and who requires it. Learn more about the baseline situation for SDG indicators 6.1.1 and 6.2.1 here: http://www.unwater.org/publication_categories/whounicef-joint-monitoring-programme-for-water-supply-sanitation-hygiene-jmp/.
Progress on Safe Treatment and Use of Wastewater – Piloting the monitoring methodology and initial findings for SDG indicator 6.3.1 By WHO and UN-Habitat on behalf of UN-Water	Leaking latrines and raw wastewater can spread disease and provide a breeding ground for mosquitoes, as well as pollute groundwater and surface water. Learn more about wastewater monitoring and initial status findings here: http://www.unwater.org/publications/progress-on-wastewater-treatment-631.
Progress on Ambient Water Quality – Piloting the monitoring methodology and initial findings for SDG indicator 6.3.2 By UN Environment on behalf of UN-Water	Good ambient water quality ensures the continued availability of important freshwater ecosystem services and does not negatively affect human health. Untreated wastewater from domestic sources, industry and agriculture can be detrimental to ambient water quality. Regular monitoring of freshwaters allows for the timely response to potential sources of pollution and enables stricter enforcement of laws and discharge permits. Learn more about water quality monitoring and initial status findings here: http://www.unwater.org/publications/progress-on-ambient-water-quality-632.
Progress on Water-Use Efficiency – Global baseline for SDG indicator 6.4.1 By FAO on behalf of UN-Water	Freshwater is used by all sectors of society, with agriculture being the biggest user overall. The global indicator on water-use efficiency tracks to what extent a country's economic growth is dependent on the use of water resources, and enables policy- and decision makers to target interventions at sectors with high water use and low levels of improved efficiency over time. Learn more about the baseline situation for SDG indicator 6.4.1 here: http://www.unwater.org/publications/progress-on-water-use-efficiency-641.

Progress on Level of Water Stress – Global baseline for SDG indicator 6.4.2 By FAO on behalf of UN-Water	A high level of water stress can have negative effects on economic development, increasing competition and potential conflict among users. This calls for effective supply and demand management policies. Securing environmental water requirements is essential to maintaining ecosystem health and resilience. Learn more about the baseline situation for SDG indicator 6.4.2 here http://www.unwater.org/publications/progress-on-level-of-water-stress-642.
Progress on Integrated Water Resources Management – Global baseline for SDG indicator 6.5.1 By UN Environment on behalf of UN-Water	Integrated water resources management (IWRM) is about balancing the water requirements of society, the economy and the environment. The monitoring of 6.5.1 calls for a participatory approach in which representatives from different sectors and regions are brought together to discuss and validate the questionnaire responses, paving the way for coordination and collaboration beyond monitoring. Learn more about the baseline situation for SDG indicator 6.5.1 here http://www.unwater.org/publications/progress-on-integrated-water-resources-management-651.
Progress on Transboundary Water Cooperation – Global baseline for SDG indicator 6.5.2 By UNECE and UNESCO on behalf of UN-Water	Most of the world's water resources are shared between countries; where the development and management of water resources has an impact across transboundary basins, cooperation is required. Specific agreements or other arrangements between co-riparian countries are a precondition to ensuring sustainable cooperation. The methodology for SDG indicator 6.5.2 measures both transboundary river and lake basins, and transboundary aquifers. Learn more about the baseline situation for SDG indicator 6.5.2 here: http://www.unwater.org/publications/progress-on-transboundary-water-cooperation-652.
Progress on Water-related Ecosystems – Piloting the monitoring methodology and initial findings for SDG indicator 6.6.1 By UN Environment on behalf of UN-Water	Ecosystems replenish and purify water resources and need to be protected to safeguard human and environmental resilience. Ecosystem monitoring, including that of ecosystem health, highlights the need to protect and conserve ecosystems and enables policy- and decision makers to set de facto management objectives. Learn more about ecosystem monitoring and initial status findings here: http://www.unwater.org/publications/progress-on-water-related-ecosystems-661.
UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) 2017 report – Financing universal water, sanitation and hygiene under the Sustainable Development Goals (including data on SDG indicators 6.a.1 and 6.b.1) By WHO on behalf of UN-Water	Human and financial resources are needed to implement SDG 6, and international cooperation is essential to making it happen. Defining the procedures for local communities to participate in water and sanitation planning, policy, law and management is vital to ensuring that the needs of everyone in the community are met, and to ensuring the long-term sustainability of water and sanitation solutions. Learn more about the monitoring of international cooperation and stakeholder participation here: http://www.unwater.org/publication_categories/glaas/.
SDG 6 Synthesis Report 2018 on Water and Sanitation By UN-Water	This first synthesis report on SDG 6 seeks to inform discussions among Member States during the High-level Political Forum on Sustainable Development in July 2018. It is an in-depth review and includes data on the global baseline status of SDG 6, the current situation and trends at the global and regional levels, and what more needs to be done to achieve this goal by 2030. Read the report here: http://www.unwater.org/publication_categories/sdg-6-synthesis-report-2018-on-water-and-sanitation/.

UN-WATER REPORTS

UN-Water coordinates the efforts of United Nations entities and international organizations working on water and sanitation issues. By doing so, UN-Water seeks to increase the effectiveness of the support provided to Member States in their efforts towards achieving international agreements on water and sanitation. UN-Water publications draw on the experience and expertise of UN-Water's Members and Partners.

PERIODIC REPORTS

Sustainable Development Goal 6 Synthesis Report 2018 on Water and Sanitation

The SDG 6 Synthesis Report 2018 on Water and Sanitation was published in June 2018 ahead of the High-level Political Forum on Sustainable Development, where Member States reviewed SDG 6 in depth. Representing a joint position from the United Nations family, the report offers guidance to understanding global progress on SDG 6 and its interdependencies with other goals and targets. It also provides insight into how countries can plan and act to ensure that no one is left behind when implementing the 2030 Agenda for Sustainable Development.

Sustainable Development Goal 6 Indicator Reports

This series of reports shows the progress towards targets set out in SDG 6 using the SDG global indicators. The reports are based on country data, compiled and verified by the United Nations organizations serving as custodians of each indicator. The reports show progress on drinking water, sanitation and hygiene (WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene for targets 6.1 and 6.2), wastewater treatment and ambient water quality (UN Environment, UN-Habitat and WHO for target 6.3), water-use efficiency and level of water stress (FAO for target 6.4), integrated water resources management and transboundary cooperation (UN Environment, UNECE and UNESCO for target 6.5), ecosystems (UN Environment for target 6.6) and means for implementing SDG 6 (UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water for targets 6.a and 6.b).

World Water Development Report

This annual report, published by UNESCO on behalf of UN-Water, represents the coherent and integrated response of the United Nations system to freshwater-related issues and emerging challenges. The theme of the report is harmonized with the theme of World Water Day (22 March) and changes annually.

Policy and Analytical Briefs

UN-Water's Policy Briefs provide short and informative policy guidance on the most pressing freshwater-related issues, which draw upon the combined expertise of the United Nations system. Analytical Briefs provide an analysis of emerging issues and may serve as a basis for further research, discussion and future policy guidance.

UN-WATER PLANNED PUBLICATIONS 2018

- Update of UN-Water Policy Brief on Water and Climate Change
- UN-Water Policy Brief on the Water Conventions
- UN-Water Analytical Brief on Water Efficiency

More information on UN Water Reports at www.unwater.org/publications

This status report provides the SDG baseline for indicator 6.5.1 "Degree of integrated water resources management implementation". It represents the work of 172 countries.

Decisions about how to allocate and use water are fundamental to sustainable development. They are also complex. Successful managing of water resources requires the interaction of governments, organizations and the private sector at all levels.

Target 6.5 of the Sustainable Development Goals is to, "by 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate". Integrated water resources management helps to balance and support the economic, social and environmental dimensions of sustainable development.

80 per cent of countries have laid the foundations for integrated water resources management. Accelerating implementation must now be the focus.

By looking into different aspects of water resources management, this report identifies areas of progress and those which need urgent attention. It explains how countries, and the international community, can build on multi-stakeholder reporting process to prioritize actions to work towards the 2030 target.

This report was produced as part of a series of reports on SDG 6 indicators, coordinated by UN-Water through the GEMI programme.

SDG 6 website: www.sdg6monitoring.org

Indicator 6.5.1 website: http://iwrmdataportal.unepdhi.org

UN WATER

UN environment

United Nations Environment Programme