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2021 Status Report on the Implementation of Integrated Water Resources Management in the Arab Region

Progress on SDG indicator 6.5.1

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2021 STATUS REPORT ON THE IMPLEMENTATION OF INTEGRATED WATER RESOURCES MANAGEMENT IN THE ARAB REGION

All figures and tables have been developed by the authors, based on data reported by countries under SDG indicator 6.5.1, unless otherwise specified. All data for SDG indicator 6.5.1 can be found on the IWRM data portal at
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Executive summary

The Arab region witnesses one of the highest rates of water scarcity globally and a very critical freshwater situation. More than 200 million people live under conditions of water scarcity and 160 million under absolute water scarcity.[1] The recent outbreak of COVID-19 revealed that over 74 million people in the region are at high risk of contracting the virus due to the absence of basic handwashing facilities with soap and water.[2] As the demand for water is expected to increase, Arab countries need to adapt to address the combined challenges associated with the rapidly growing population, by more than one-third by 2050,[3] economic development, environmental considerations and climate change. Hence, there is a need to accelerate the implementation of integrated water resources management (IWRM) and innovate ways to manage competing demands on this valuable resource.

In order to meet the challenges and future requirements for sustainable development, the Arab Ministerial Water Council included the advancement of the IWRM principles among the objectives of the 2010-2030 Arab Strategy for Water Security (ASWS) as a key element in water policies in Arab States. In addition, the presence of active policies, legislation and institutional frameworks for IWRM is one of the indicators of this strategy.[4] All Arab countries are committed to the vision of the 2030 Agenda for Sustainable Development and most have developed strategies for the Sustainable Development Goals (SDGs) in their national development plans, explicitly SDG target 6.5, thus committing to IWRM implementation as an important mechanism for achieving sustainable development and efficient management of water resources.

SDG 6: Ensure availability and sustainable management of water and sanitation for all

Target 6.5: By 2030, implement IWRM at all levels, including through transboundary cooperation as appropriate.

Indicator 6.5.1: Degree of IWRM implementation (0-100).

This report, a culmination of fruitful cooperation between the Economic and Social Commission for Western Asia (ESCWA) and UNEP-DHI, provides a progress update on implementing IWRM in the Arab region and identifies priority areas that will help accelerate full implementation. It is based on data from 21 out of the 22 countries in the region that reported on SDG indicator 6.5.1 across 2017 and 2020. The analysis of progress towards the 2030 target is based on 15 countries that participated in this survey in 2017 and 2020.

As a comprehensive quantitative assessment of regional progress in IWRM implementation, findings and recommendations from this report will be drawn upon to inform the Water Action Decade's regional preparatory process and reporting, which can mobilize the needed action to achieve internationally agreed goals and targets related to water.

SDG indicator 6.5.1 is measured on a scale of 0-100, based on a country survey containing 33 questions across the four dimensions of IWRM: (1) the enabling environment of policies, laws and plans; (2) institutions and stakeholder participation; (3) management instruments; (4) financing for water resources management. The indicator scores are categorized as follows:

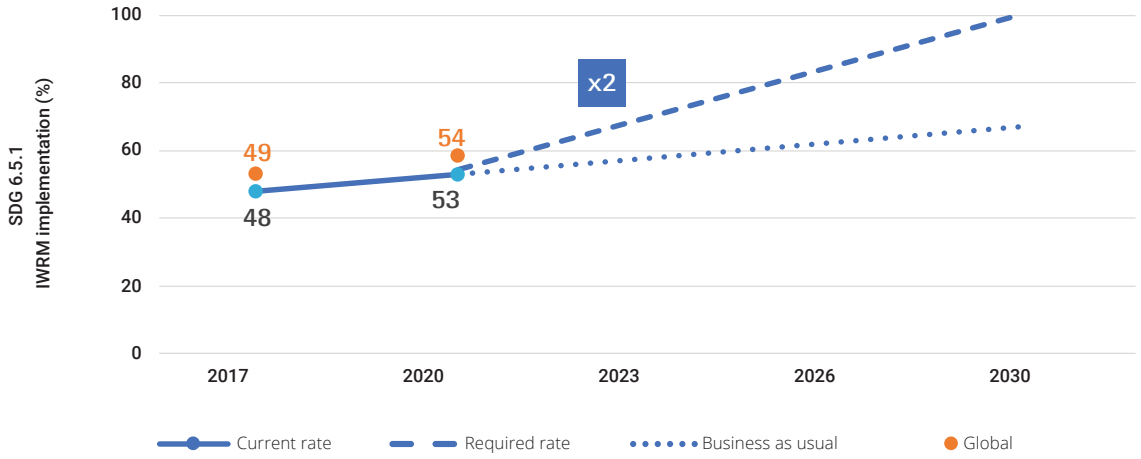
IWRM implementation levels and score thresholds (SDG 6.5.1)

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

◊ Progress of overall IWRM implementation in the region: key findings

- **The rate of IWRM implementation needs to double to reach SDG target 6.5 by 2030:** between 2017 and 2020, the regional average increased from 48 to 53, similar to progress at the global level (49 to 54). Considering SDG target 6.5, and that the 2010-2030 ASWS has prioritized IWRM as a key element in water policies in Arab States, business as usual is not an option, particularly for the nine countries in the medium-low and low implementation categories.

Rate of IWRM implementation



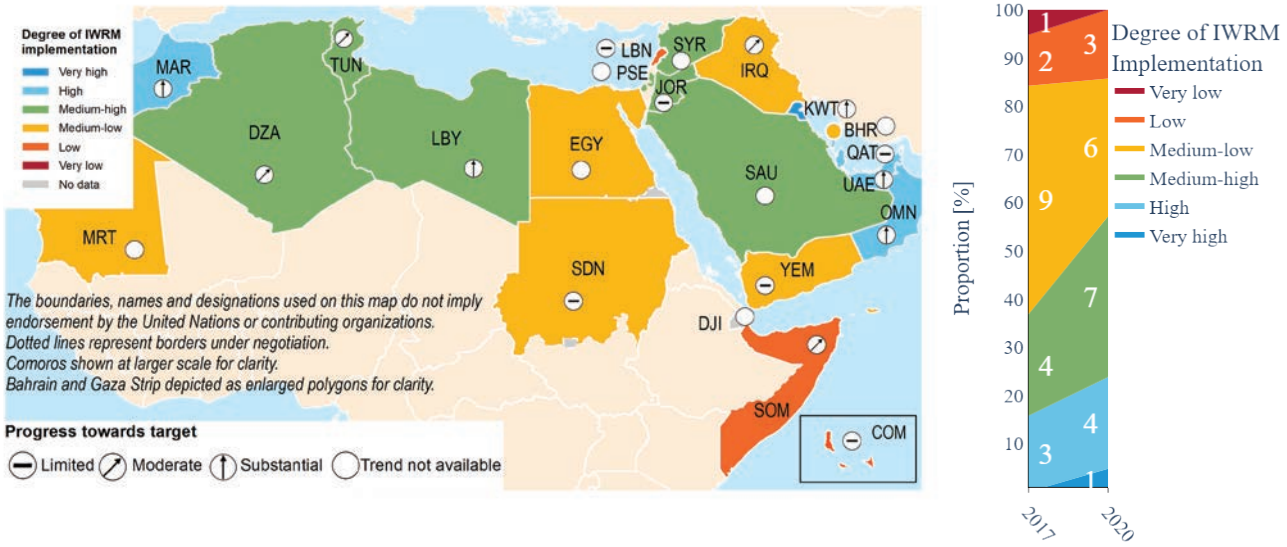
- **There are huge variations between countries and sub-regions:** the reported SDG 6.5.1 scores range from 20 (low implementation) to 94 (very high implementation), which demonstrates the need for each country in the region to carefully assess its own strengths and weaknesses for progressing with IWRM implementation.

  At sub-regional levels,[5] the Gulf Cooperation Council (GCC) countries have the highest average IWRM implementation in 2020 (72), followed by the Maghreb and Mashreq (58: medium-high, and 48: medium-low, respectively). The Southern sub-region lags behind with a medium-low level (28). However, these averages may mask important variations between countries in the same sub-region, like between Kuwait (94) and Bahrain (39) in the GCC. While the level of development and governance frameworks are important for advancing IWRM implementation, the key drivers are political will, financing and the priority given to water resources management.

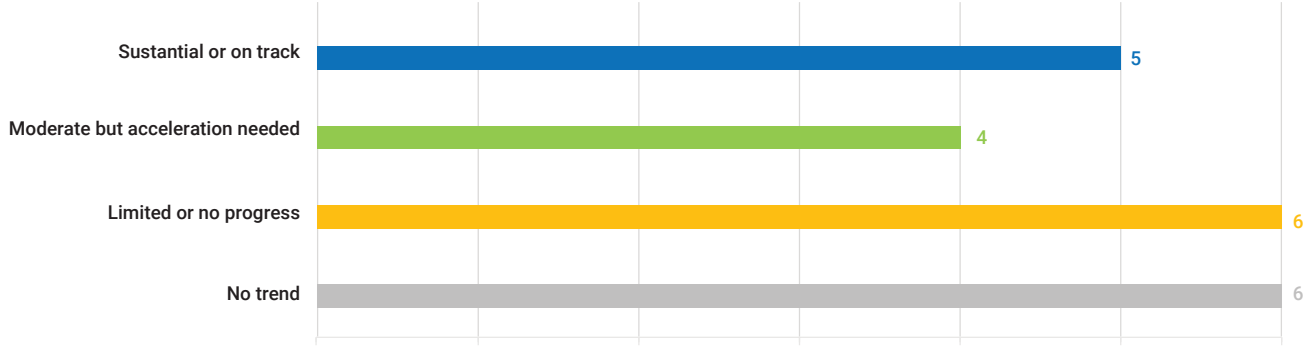
  These findings stress the importance of cooperation and experience sharing between and within sub-regions and highlight the role that regional and sub-regional organizations such as the League of Arab States, ESCWA, the GCC Supreme Council and others need to play to accelerate progress towards the 2030 IWRM target in the Arab region.

- **Real and rapid progress is possible:** the rate of progress between 2017 and 2020 varies across the region. Nine Arab States made good progress in their IWRM implementation, which attests to the ability of Arab countries to undertake the necessary steps to move forward. To accelerate progress throughout the region, success stories and good practices should be shared among countries. On the other hand, six countries made limited to no progress in the same period. To avoid the status-quo and move faster towards full implementation, these countries need to identify and act upon their weaknesses.

Degree of IWRM implementation, 2020 and level of progress towards SDG target 6.5, 2017 and 2020



Progress towards SDG target 6.5 in the Arab region, 2017-2020



◊ Progress across the four IWRM dimensions

The highest implementation level (medium-high) is obtained for institutions and participation (58), enabling environment (56) and management instruments (54). The financing dimension is lagging behind (medium-low, 46). This indicates that decision-makers are aware of the importance of the enabling conditions, which include policy, legal and strategic planning, the participatory approach involving different institutions and stakeholders as well as the tools and methods to use when making choices between different actions. Nevertheless, countries should deploy more efforts to increase financial resources for water management and improve revenue raising for water services.

- **Enabling environment that can be established by developing and implementing laws, policies and plans:** on average, the region has adequate capacity to establish an enabling environment for IWRM under long-term programmes (medium-high, 56), which is comparable to the world average (57). In most Arab countries, policies, laws and plans are in place at the national level but more efforts are needed to transfer capacity and knowledge from central governments to local and/or basin entities. Despite the dependency of most Arab States on transboundary surface and/or groundwater resources, the comparison of the seven enabling environment elements for implementation demonstrates that progress is lowest for instituting transboundary management arrangements.

  The Arab region has made good progress on implementing IWRM enabling environments between 2017 (medium-low, 47) and 2020 (medium-high, 56). The trend has been positive for all the seven elements of the dimension. This positive regional result should not hide disparities between countries since three made substantial progress, seven showed moderate progress while five have limited or no progress.

- **Institutions and participation:** the Arab region's overall performance in establishing institutions and engaging stakeholders for IWRM implementation is at a medium-high level with an average score of 58, same as the global average. Cross-sectoral coordination has the highest score (70), at the threshold between medium-high and high levels. This result goes in the right direction given the importance of cross-sectoral coordination for effective IWRM implementation in the water-scarce Arab region where water demands of various sectors and environmental uses can be a source of tension. However, many countries still report that cross-sectoral coordination remains a significant and ongoing challenge to implement in practice. The lowest performance is recorded for the participation of vulnerable groups, which stands at a medium-low level of implementation (36). This aspect is particularly important in the Arab region where vulnerable communities are found within groups of refugees and internally displaced persons estimated at around 26 million.[6]

  In general, countries in the Arab region achieved good progress between 2017 and 2020 in strengthening IWRM institutions and participation with the average implementation of this dimension increasing from 51 to 58.

- **Management instruments:** the Arab region is at a similar level (54) as the global average (55) for the development and implementation of IWRM management instruments with all elements in the upper level of medium-low or medium-high levels (46 to 65). While this is an encouraging result, the region should increase efforts in all categories, with particular attention to operational water management instruments related to ecosystems, monitoring basins and aquifers and sharing data on transboundary waters. Countries should invest in effective data and information sharing systems both at the national and regional levels to monitor resource availability, use and quality, particularly important in the water-stressed Arab region.

  From 2017 to 2020, four countries made substantial progress, three showed moderate progress while eight made limited or no progress. The overall trend

may be positive, but it should not mask the realities of several countries that need to work on improving their implementation rates to meet the 2030 objectives.

Targeted country-level efforts need to be complemented by greater coordination and experience sharing between Arab countries and sub-regions to bridge the large gap between the GCC (high) and the Southern sub-regions (low) implementation levels of this key IWRM dimension for the Arab region.

- **Financing:** financing for water resources management shows the lowest score of the four IWRM dimensions in the region. This medium-low score (46) is similar to the world's average indicating that this dimension is not given the appropriate attention worldwide although the success of IWRM implementation is tightly linked to budgeting and financing available for water resources development and management.

  Arab countries are doing better in budget allocation for infrastructure and management at the national level (medium-high, 53) compared to the subnational, basin or transboundary, levels (medium-low, 37). Even if it is widely acknowledged in the region that increasing financing and investment is crucial for IWRM implementation at all levels, with special attention to transboundary financing, most Arab States still struggle to put in place effective and efficient financial arrangements for water resources development and management.

  In general, the Arab region has made an average progress on implementing IWRM financing between 2017 and 2020, with substantial progress in five countries, moderate progress in three and limited or no progress in seven countries. Some important issues that Arab countries need to urgently address include the diversification of financial resources for water infrastructure and IWRM elements implementation as well as combining public funds with other financing sources, including leveraging private investment and climate financing. More attention should also be given to revenue raising for IWRM implementation through adequate tariff structures for water services and recovery of the fees for water use.

◊ Progress on Arab regional priorities

Implementation of IWRM is essential to advance action on Arab regional priorities, in particular groundwater and shared water resources. The following insights draw on the findings presented in this report:

- The average implementation scores for groundwater (49) and transboundary water resources (47 across the four IWRM dimensions), are in the medium-low category, which calls for increased attention from Arab countries.
- Despite the importance of groundwater as a strategic resource that is overexploited in most Arab countries, the average implementation of aquifer management instruments is standing at medium-low (49) with limited progress compared to the regional average implementation in 2017 (48). To advance progress on this regional priority, it is recommended that countries with high degree of dependence on groundwater resources take the necessary measures to develop aquifer management instruments and upscale dedicated financing.
- Arab nations highly depend on transboundary water resources, both from within and outside the region, yet the average level of implementation for transboundary water resources, across the four IWRM dimensions, is at medium-low level (47). Only few countries have actively and successfully implemented cooperation agreements with riparian countries. Consequently, it is urgent that Arab States establish transboundary arrangements with their neighbours and/or speed up implementation of existing ones. Efforts are also needed to set up transboundary data and information-sharing arrangements to better monitor and manage transboundary water resources in the region. Special attention should be directed to increasing transboundary financing to support transboundary water projects.

Between 2017 and 2020, only limited progress was recorded at the regional level on IWRM implementation for transboundary water resources. Therefore, several countries need to work on improving their implementation rates for the Arab region to be on track towards achieving the SDG targets.

This work is needed to accelerate progress on SDG indicator 6.5.2, which covers operational arrangements for transboundary collaboration.[7]

◊ Strategic actions to accelerate IWRM implementation in the Arab region

Through their responses to the surveys for SDG indicator 6.5.1, the 21 reporting countries in the Arab region have identified the main priority areas they have to address to progress towards full IWRM implementation. While each country context is different, seven key priorities stand out:

1. **Strengthening political will:** high-level political will is essential for planning coordinated projects

and programmes, deciding on the timing for their implementation, mobilizing sufficient human and financial resources and establishing follow-up mechanisms to maintain momentum for effective and efficient execution. Some actions to strengthen political will include: (1) communicating the value of IWRM concepts at high governmental and strategic levels; (2) involving finance ministers as champions for IWRM implementation; (3) mitigating the effect of potential political turmoil on IWRM implementation.

2. **Coordinating financing and leveraging climate financing:** the effort in financing the water sector and water-related SDGs must be increased through more coordinated national financing across ministries and institutions. Attracting more funding requires an enabling environment. Arab States should develop the necessary policies and regulations to attract new funding and build new partnerships with the private sector. As the world is gradually recovering from the COVID-19 pandemic, many developing countries have been calling for increased finance for adaptation so that it equals finance for mitigation, emphasizing that adaptation should be central to recovery. Consequently, increasing adaptation finance for water is imperative. In this context, as countries are updating their nationally determined contributions (NDCs) and developing their national adaptation plans, they need to align their priorities and needs with their national water strategies in terms of cost estimates and timeframes. Arab countries also need to further quantify their needs and explore new and innovative instruments of finance to implement those strategies. At the same time, more international climate finance should be unlocked.

3. **Ensuring coherent governance within and across sectors:** water laws need to consolidate IWRM principles and their decrees of application need to be activated. Water legislation and plans should address the coordination with all relevant sectors. In some Arab countries, political stability is also an important factor in ensuring the continuity of water governance arrangements. Another important requirement is to establish national and subnational governmental authorities with clear mandates and technical, human and financial capacities to lead IWRM implementation and formalize consultation mechanisms with all water-related agencies. Besides, civil society, local stakeholders and water users need to be involved in decision-making related to the planning, financing, operation and maintenance of water projects. This will help increase efficiency, enforcement and accountability for the sustainable management of water resources, covering the key aspects of water allocation, availability and quality. Leveraging private sector participation in IWRM in the Arab region will require strengthened regulation frameworks and public authorities' capacity to deal with relevant contracts, particularly aspects related to monitoring and credibility through transparent and publicly accessible reporting on the use of revenues, as well as social safeguards.

4. **Improving availability and access to data and information:** this will require expanding and modernizing national monitoring of water availability, systemizing data and information sharing within countries, and prioritizing transboundary data and information sharing between countries.

5. **Building capacity and engaging researchers:** through the development and implementation of targeted training, skills development and knowledge management programmes to improve the capacity and expertise of water professionals in all aspects related to IWRM. More attention also needs to be directed towards engaging researchers from the region to decrease the dependence on imported know-how and equipment.

6. **Leveraging innovation and technologies:** including the promotion of fit-for-purpose technologies that specifically answer the needs identified by Arab countries such as low-cost technologies for water reuse and water quality monitoring according to local and international standards, and digital water technologies for aquifer management. Moreover, a significant potential for innovation lies in non-technological areas and some Arab States have become aware of the value of innovation in finance, stakeholder participation, or regulation of water services.

7. **Unleashing female and youth potential and reaching gender equality:** among the key enablers is the establishment of a national legal framework that integrates the concepts of equality and facilitates gender mainstreaming in water laws, policies and strategies. Implementation needs to be supported by concrete action plans and earmarked funding allocated to gender mainstreaming in IWRM. Measuring real progress towards gender equality in IWRM also necessitates to design gender-sensitive indicators, collect gender-disaggregated data and establish monitoring and evaluation processes. Finally, there is a need to build capacity and technical expertise in gender issues at the level of water institutions.

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Acronyms

AFSD	Arab Forum for Sustainable Development
AMWC	Arab Ministerial Water Council
ASWS	Arab Strategy for Water Security
Cap-Net	International Network for Capacity Development in Sustainable Water Management
ESCWA	Economic and Social Commission for Western Asia
FAO	Food and Agriculture Organization of the United Nations
GAF	Global Acceleration Framework
GCC	Gulf Cooperation Council
GLAAS	Global Analysis and Assessment of Sanitation and Drinking-Water
GWP	Global Water Partnership
HDI	Human Development Index
HLPF	High-level Political Forum
IWRM	integrated water resources management
KPIs	key performance indicators
MEW	Ministry of Electricity and Water
MPI	Multidimensional Poverty Index
MWRI	Ministry of Water Resources and Irrigation
NDCs	nationally determined contributions
NWRP	National Water Resources Plan
SDG	Sustainable Development Goal
STARS	Sector Technical Assistance Reforms Support
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNEP-DHI	UNEP-DHI Centre on Water and Environment
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN-Water	United Nations Water
WASH	Water, Sanitation and Hygiene


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The setting

1

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1.1 Water resources management in the 2030 Agenda for Sustainable Development

The Arab region witnesses one of the highest rates of water scarcity globally and a very critical freshwater situation.

More than 200 million people live under conditions of water scarcity (500-1,000 m^3/person/year) and 160 million under absolute water scarcity (< 500 m^3/person/year).[8]

The demand for water is expected to increase in the region and the Arab countries need to adapt to meet the combined challenges associated with the rapidly growing population, by more than one-third by 2050 (from 439 million in 2020 to 677 million in 2050),[9] economic development, environmental considerations and climate change. Hence, there is a need to accelerate IWRM implementation and innovate ways to manage competing demands on this valuable resource.

Sustainable management of water resources is essential for social development and economic prosperity. It plays a critical role in reducing poverty and inequality, maintaining healthy ecosystems, and mitigating and adapting to climate change. Therefore, Sustainable Development Goal 6 (SDG 6) – "Ensure availability and sustainable management of water and sanitation for all" – supports many, if not all, of the other 16 SDGs, particularly those related to health and disease prevention, education, food, gender equality, energy and climate change.

However, global progress on SDG 6 is alarmingly off track.[10] To rapidly improve such progress, the SDG 6 Global Acceleration Framework (GAF) was launched in July 2020 to mobilize action across governments, civil society, the private sector and the United Nations to better align efforts, optimize financing and enhance capacity and governance. Five accelerators are currently driving action: (1) optimized financing; (2) improved data and information; (3) inclusive human and institutional capacities at all levels; (4) innovative practices and technologies; (5) governance.[11]

An important contribution to the second accelerator on improving data and information resides in the monitoring of progress towards all SDG 6 targets (table 1.1).

The targets agreed upon by member States aim to improve the standard of water supply, sanitation and hygiene services (targets 6.1 and 6.2); increasing treatment, recycling and reuse of wastewater (target 6.3); improving efficiency and ensuring sustainable withdrawals (target 6.4); and protecting water-related ecosystems (target 6.6), all as part of IWRM (target 6.5). The targets also address the means of implementation for achieving these development outcomes (targets 6a and 6b).

Table 1.1 Global status of SDG 6 targets

SDG 6 target area	Progress	Priority areas for acceleration
6.1 Drinking water	Off track: progress rate needs to increase fourfold	No SDG region is on track. 771 million people still lack basic drinking water services.
6.2 Sanitation		No SDG region is currently on track. 1.7 billion people still lack basic sanitation services and 494 million still practise open defecation. Two out of five people in rural areas and nearly two thirds of the population of least developed countries lack handwashing facilities with soap and water at home. In sub-Saharan Africa, one out of three people have no handwashing facility at all.
6.3 Ambient water quality and wastewater treatment	Insufficient: data are likely off track	Regional disparities are broad. Some data gaps remain. Urgent action is necessary to improve monitoring systems for both surface and groundwater and to define water quality standards.
6.4 Water-use efficiency and water stress	Insufficient: data are likely off track	Improved data coverage is needed to fully assess water-use efficiency. Accelerated efforts are especially needed in agriculture, the most water-demanding economic sector. Many countries, in the North Africa and Western Asia region, withdraw all their renewable water resources or even more (up to 1,000 per cent) from non-renewable resources that will eventually run dry.
6.5 IWRM implementation and transboundary cooperation	Off track: progress rate needs to double	5 SDG regions are not on track. Priority needs to be given to the 47 per cent of countries with low and medium-low IWRM implementation, noting that implementation levels are lowest in Latin America and the Caribbean, Oceania, Central and Southern Asia, and sub-Saharan Africa. Many rivers, lakes and aquifers are lacking operational arrangements for water cooperation, especially in Latin America, North Africa and Western Asia, Central/Southern Asia, and Eastern/South-Eastern Asia.
6.6 Freshwater ecosystems	Off track	All SDG regions contain some river basins experiencing high change in the extent of their surface water.

Source: UN-Water, Summary Progress Update 2021: SDG 6 – Water and Sanitation for All (2021).

Two indicators measure progress towards SDG target 6.5: "By 2030, implement IWRM at all levels, including through transboundary cooperation as appropriate":

- 6.5.1 on IWRM implementation (0-100).
- 6.5.2 on proportion of transboundary basin area with an operational arrangement for water cooperation.

When it comes to IWRM, 107 countries are not on track to have sustainably managed water resources by 2030 and only 24 countries reported that all the rivers, lakes and aquifers that they share with their neighbours were covered by operational arrangements for cooperation.

This report presents the status and trends on IWRM implementation (indicator 6.5.1) in the Arab region.

IWRM implementation is particularly important in the water-scarce Arab region where more than 360 million people are living in conditions that range from water scarcity to absolute scarcity.[12] Sustainable management of water resources in the region is complicated by several challenges such as rapidly growing populations, high dependency on shared water resources, inefficient use and pollution of water, climate change impacts, and political instability and conflicts. Hence, successful water resources management requires coordinated actions of governments, organizations and the private sector at all levels and across all sectors.

Arab States have recognized the value of IWRM and have included its principles as important pillars of the Arab Strategy for Water Security (ASWS) for the period 2010-2030.[13] Moreover, by adopting the 2030 Agenda, Arab countries have committed to achieving the SDGs and more explicitly SDG target 6.5, thus reaffirming IWRM implementation as an important mechanism for achieving sustainable development and efficient management of water resources. The IWRM implementation elements have been the subject of the 2021 Arab Forum on Sustainable Development (AFSD)[14] and the High-level Political Forum (HLPF) in 2021.[15]

The International Decade for Action (2018-2028), "Water for Sustainable Development", commonly referred to as the Water Action Decade was proclaimed by the United Nations General Assembly in 2016. The Decade and its review process are firmly grounded in promoting the implementation of IWRM as the Decade's objectives explicitly focus on IWRM. In tandem, regional preparations in the Arab region for the midterm comprehensive review of the Water Action Decade fall under different global, regional, national and institutional frameworks that all converge towards advancing action on IWRM. As a comprehensive quantitative assessment of regional progress in IWRM implementation, findings and recommendations from this report will be drawn upon to inform the Decade's regional preparatory process and reporting, which can mobilize the needed action to achieve internationally agreed goals and targets related to water (section 5.1).

1.2 COVID-19 impact on IWRM implementation

At the global level, the COVID-19 pandemic has hindered progress in IWRM implementation, yet it offers opportunities for building back better.[16] In some countries, the pandemic has delayed implementation of policies, plans and projects, while in others, it has led to the reduction of water sector investments. Nevertheless, the pandemic has stressed the importance of securing access to Water, Sanitation and Hygiene for All (WASH). Furthermore, the restrictions on physical meetings during the pandemic have opened new possibilities for online interactions, which offer opportunities to improve stakeholder participation.

In the Arab region, the impact of COVID-19 on water management is very acute given the significant pressure to ensure access to clean water, safe hygiene and dignified sanitation under conditions of water scarcity. In addition, over 74 million people in the region are at high risk of contracting COVID-19 owing to a lack of access to basic handwashing facilities. The risk is higher for nearly 87 million people in the region who lack access to an improved drinking water source on premises and are required to collect water from public standpipes and sources, particularly women and girls.[17]

The COVID 19 pandemic has heightened awareness of the importance of sustainable water resources management in the Arab region and has contributed to governments re-prioritizing the water sector after decades of under-investment and lack of political prioritization. At a meeting convened virtually on 2 July 2020, the Technical Scientific and Advisory Committee of the Arab Ministerial Water Council (AMWC) emphasized the importance of political will to build resilience of the water sector to the COVID-19 sanitary crisis and to future shocks. One of its main recommendations was to collect experiences of the water and sanitation sector in the Arab region during the early response phases of the COVID-19 pandemic to document best practices to inform continuity plans. Therefore, a survey was developed and sent to all Arab States to collect data and information on the impact of COVID-19 on the water and sanitation sector and identify response measures and initiatives that help convert this crisis into an opportunity to accelerate the implementation of SDG 6.

Several Arab countries, such as Algeria and Yemen, explicitly indicated that strengthening IWRM implementation was the way to build water sector resilience in the face of COVID-19 crisis and future shocks. Libya, Morocco, Qatar and Tunisia also established plans, strategies and programmes that are clearly consistent with IWRM through the coordination with other sectors such as agriculture, electricity and health. Moreover, improving the enabling environment, developing regulatory frameworks, building capacity for water management, keeping abreast with relevant innovations and technologies, reaching out to vulnerable communities, mobilizing innovative financing and strengthening regional cooperation are among the prospects identified by Arab countries to accelerate IWRM implementation in the region.[18]

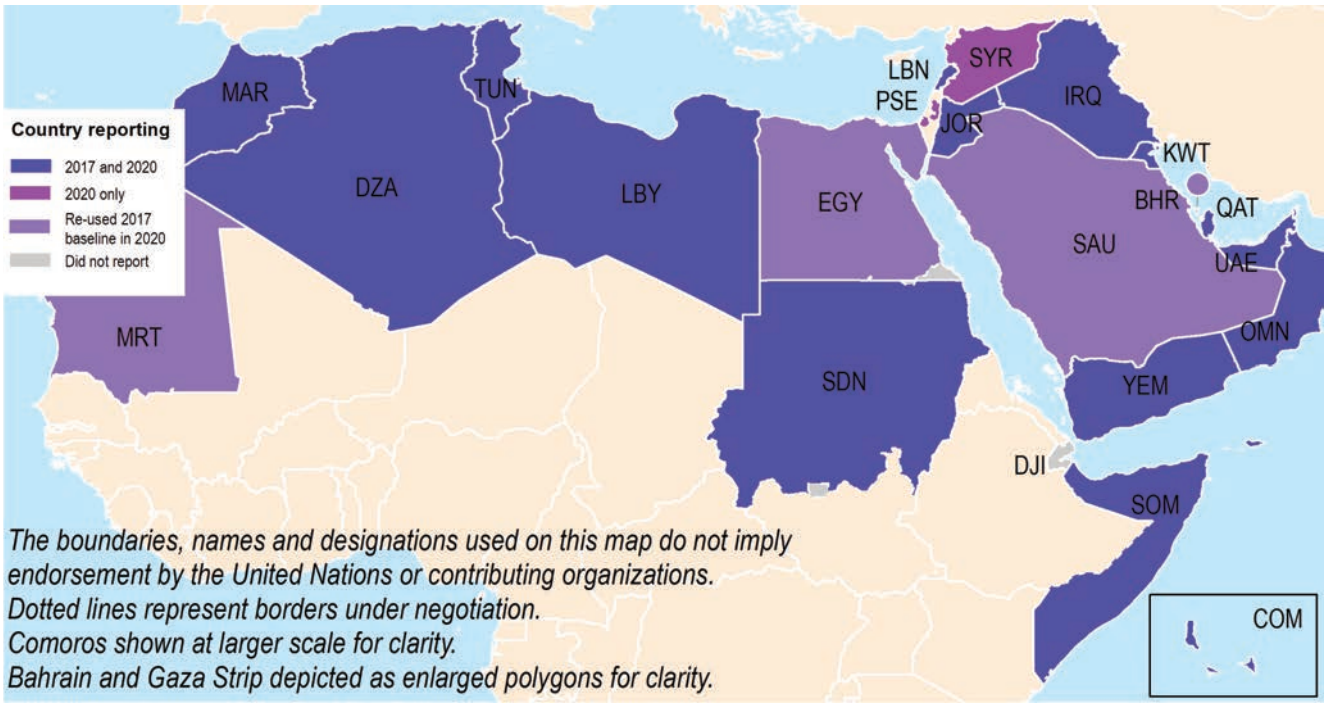
1.3 National data collection processes and COVID-19 limitations

Arab States were invited to report as part of the global data drive on SDG 6, including indicator 6.5.1. The State of Palestine was also invited to report on indicator 6.5.1 for the purposes of this Arab region progress report. The data drive on indicator 6.5.1 was coordinated by the United Nations Environment Programme (UNEP), with support from UNEP-DHI, the Global Water Partnership (GWP), and the United Nations Economic and Social Commission for Western Asia (ESCWA). Although initially planned for approximately six months, the data drive was extended to be open for most of 2020, partly to account for delays due to the COVID-19 pandemic.

While COVID-19 impacts and associated restrictions posed challenges to reporting, with many staff working from home and limits on workshops, they also provided an opportunity to organise online consultations, with the potential to involve a greater variety and number of stakeholders. The SDG indicator 6.5.1 Help Desk produced guidelines on switching to more online modes of consultation. However, it appears these modes were not widely applied in the region (section 1.4).

Despite the COVID-19 impact and other political and economic challenges mentioned by numerous countries in the region, 21 out of 22 countries submitted country reports on SDG indicator 6.5.1. 15 of these were reporting for the second time, following baseline reporting in 2017, allowing for progress to be measured towards target 6.5. Two countries, the State of Palestine and the Syrian Arab Republic, reported for the first time. Four countries, Bahrain, Egypt,[19] Mauritania, and Saudi Arabia, re-used their baseline submissions for reporting in 2020 (figure 1.1). Overall, the efforts of countries are to be commended, especially considering the challenging circumstances, though there are some lessons to be learned for subsequent reporting rounds (section 1.4 and annex 1).

Figure 1.1 Status of country reporting on SDG indicator 6.5.1 in the Arab region, 2017 and 2020



1.4 Monitoring and survey process using multi-stakeholder approaches

All countries were encouraged to hold multi-stakeholder consultation processes to complete the SDG indicator 6.5.1 survey. The two main objectives of this survey were to: (a) provide transparent and accurate results; (b) leverage the reporting process to facilitate greater interaction between key stakeholders to develop a common understanding of IWRM principles, challenges and opportunities in each country, and thus facilitate progress on various aspects of water resources management.

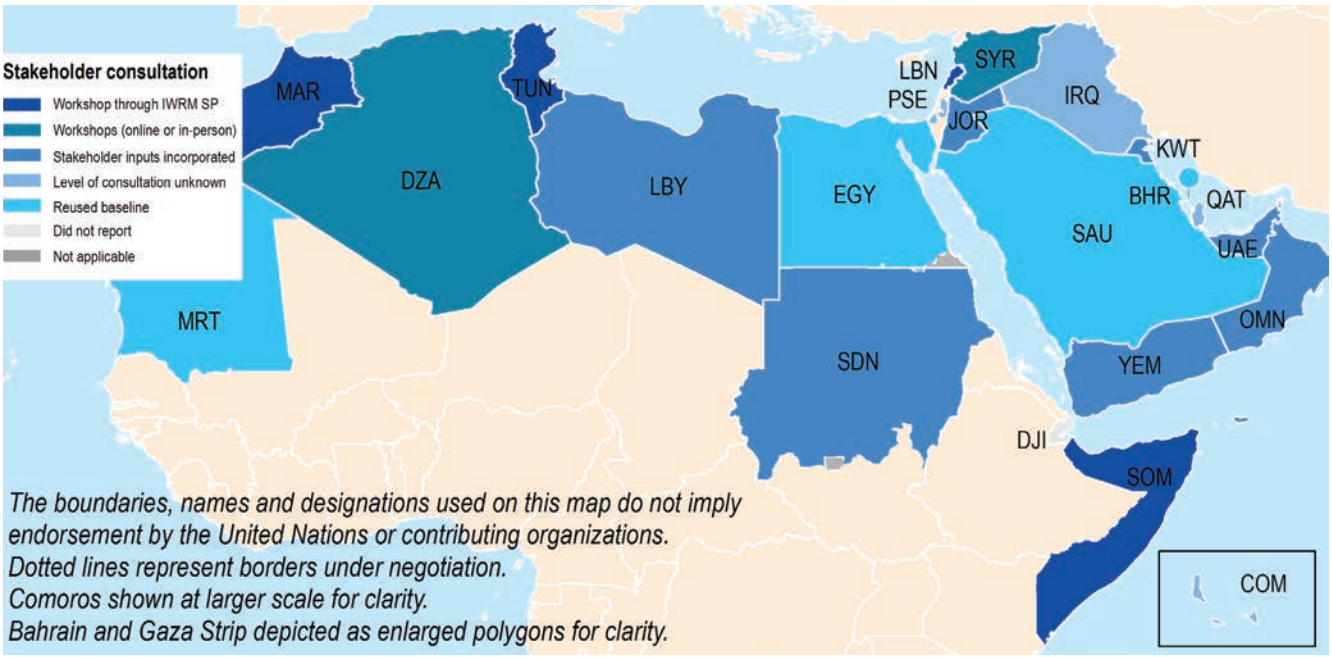
Of the 21 countries that reported on SDG 6.5.1 in 2020, only five are understood to have held significant

consultation processes (figure 1.2). Three of these – Lebanon, Somalia and Tunisia – did so with the support of the SDG 6 IWRM Support Programme,[20] and two – Algeria and the Syrian Arab Republic – conducted the processes without external support. Seven countries are understood to have incorporated various stakeholder inputs into the final submission, although without extensive discussion on the various subjects.[21] Five countries are understood to have had rather low levels of consultation beyond immediate colleagues, or their level of consultation is unknown.[22] Four countries reused their baseline submission from 2017 and their 2020 submission, and therefore no further stakeholder consultation was undertaken in 2020.[23]

The types of stakeholder groups mostly involved were national and subnational water agencies or similar stakeholders, and academia. The engagement was relatively low with other stakeholder groups including other public sector agencies; basin or aquifer organizations; water user associations; civil society; vulnerable groups; gender expertise; private sector and transboundary expertise (annex 1).

Compared to other regions, the level of stakeholder engagement in the reporting process appears to be relatively low, or there is relatively little information provided by countries on the process. Reasons for this vary from country to country, but the situation highlights the need to strengthen stakeholder consultation in subsequent reporting rounds.

Figure 1.2 Stakeholder consultation for reporting on indicator 6.5.1, 2020



Box 1.1 Robust stakeholder consultation processes provide added benefits

Three countries – Lebanon, Somalia and Tunisia – were supported through the SDG 6 IWRM Support Programme to hold multi-stakeholder consultation processes. In Somalia, the four-day consultation processes provided an opportunity for a wider group of stakeholders (representing 25 organizations) to become sensitized to, and discuss, the draft National Water Resources Strategy (finalized in 2021). Stakeholders agreed on the need to extend and broaden the process by holding a larger set of meetings across the country to share the knowledge and experience of IWRM implementation among all relevant stakeholders, including from the federal States. In Lebanon, the process provided an opportunity to gain consensus on the full value and urgency of implementing the water law No. 77 of 2018 as a vital enabler of progress on several IWRM aspects. A recommendation was also made to hold a national (interim) target setting exercise, since the country is unlikely to meet the global target by 2030. In Tunisia, the process allowed more than 40 participants from sectoral (WASH, agriculture, environment, etc.) and cross-cutting (planning, finance, statistics, etc.) government authorities to discuss mechanisms for strengthening basin and aquifer level management, in the context of the decentralization process established by the 2014 constitution.

Source: Annex E of the SDG 6.5.1 country surveys, available from the IWRM Data Portal (http://iwrmdataportal.unepdhi.org/), and the SDG 6.5.1 stakeholder consultation reports, available at https://www.gwp.org/en/sdg6support/.

Recommendations for enhancing stakeholder consultation in subsequent rounds

1. Reiterate the benefits of broader stakeholder consultation to national focal points and colleagues at the very beginning of the next reporting round and provide recommendations for them to gain the necessary buy-in at country level. This may involve some targeted communication or training in addition to the standard Monitoring Guidelines provided by UNEP.
2. Make countries aware of the potential support available through the SDG 6 IWRM Support Programme, which may include the provision of a facilitator to help the focal point organize the process.
3. Facilitate the engagement of AWARENET IWRM focus group members by putting the focal points in touch with them at the start of the reporting process.
4. Increase the engagement of ESCWA in inviting countries to report, and in providing technical and political backing to run transparent and robust processes.
5. Ensure that SDG 6 overall focal points, as well as focal points from other indicators (especially 6.5.2), are aware of, and given the opportunity to participate in, the reporting process.
6. Use a mixture of online and in-person approaches to ensure a wider range of stakeholder consultation, reduce budgets, and remain flexible in the face of unforeseen circumstances (for example, health restrictions or political challenges).

Further guidance is provided in

1. The SDG 6 IWRM Stage 1 Support Package (to be updated prior to the next reporting round).[24]
2. Multi-Stakeholder Consultation Processes for SDG 6 Monitoring report.[25]
3. Chapter 3 of the report "Progress on IWRM in the Asia-Pacific Region 2021" (box 1.2).[26]

Box 1.2 Monitoring and survey process using a multi-stakeholder approach in Asia

For the second round of SDG 6.5.1 global data collection in 2020, 16 countries from pan-Asia adopted a multi-stakeholder consultation approach, supported by Country Water Partnerships through the SDG 6 IWRM Support Programme, which operates under the auspices of UNEP, and coordinated by GWP in collaboration with UNEP-DHI and Cap-Net. To harvest the learnings generated from experiences in this reporting exercise, GWP asked countries to pinpoint challenges encountered during the survey and multi-stakeholder consultation and how they resolved them. Most countries and participants in the learning exchange workshop recognized the importance of the country facilitator and indicated their appreciation of GWP and Cap-Net training for facilitators. They also recommended building and leveraging good relationships with stakeholders by the country focal points, ensuring adequate time for the preparation of needed materials, allocating appropriate time to the process to maximize the participation of stakeholders, and developing a platform or community of practice for sharing best practices and innovations.

Source: Global Water Partnership (GWP) and UNEP-DHI, Progress on IWRM in the Asia-Pacific Region 2021: Learning Exchange on Monitoring and Implementation Towards SDG 6.5.1 (2021).

1.5 How to interpret results?

IWRM survey and reporting process: countries report on SDG indicator 6.5.1, as part of a global reporting process, every three to four years. Most countries undergo comprehensive, multi-stakeholder processes to complete the survey, which are vital to working towards the target. 33 survey questions cover the four main dimensions of IWRM:[27] (1) enabling environment (laws, policies and plans); (2) institutions and participation; (3) management instruments; (4) financing. Each question is scored on a scale of zero to 100, guided by specific threshold descriptions.

Calculating the indicator score: question scores in each dimension are averaged to give four-dimension scores, which are then averaged to give the indicator score (table 1.2).

IWRM implementation levels: six implementation levels have been defined, from "very low" to "very high", with general interpretations and score thresholds given below.

Table 1.2 IWRM implementation levels and their interpretation

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

Data coverage: this report is based on data from 21 out of 22 Arab States in the Arab region,[28] including the State of Palestine, which submitted its report for the purposes of this regional analysis. Of these, 15 countries have data for both 2017 and 2020, allowing for analysis of progress towards the target, while two countries submitted data for the first time, the State of Palestine and the Syrian Arab Republic.

Calculating progress: progress levels are defined as "limited or no progress", "moderate progress but acceleration needed" and "substantial progress or on track", based on the ratio of actual rate of progress to required rate of progress to reach the target.[29] While two data points cannot provide a statistically strong trend projection, and IWRM implementation is not a linear process, the data at least gives an approximation of the rate of implementation. For most countries, the data collection process in 2020 has been more comprehensive than in 2017. For a few countries, this may have resulted in significant changes in score, which are more likely to be a result of this more robust process, rather than significant progress or regression.

Differences between 2017 and 2020 surveys: any changes were kept to a minimum to ensure comparability between the 2017 and 2020 data sets. Minor changes, based on country feedback from the baseline, are as follows: questions 1.2d and 2.2f, on subnational laws and institutions, respectively, were only applicable to federated countries in 2017, but in 2020 all countries were invited to respond, acknowledging that most countries have subnational regulations and authorities; the three questions on gender in 2017 at national, subnational and transboundary levels (2.1e, 2.2c and 2.2d), were merged into a single question in 2020 (2.2d), as most countries reported the same or similar scores at each level in 2017, so the three questions did not add significant value. The merging of these questions created space for two additional questions in 2020: 2.2d on vulnerable groups; and 4.2d on subnational or basin budgets for IWRM elements.[30]

Global target: in line with target 6.5, the global aspirational target for indicator 6.5.1 is to reach a "very high" level of implementation of IWRM, or an average score of 91-100, by 2030. Countries may also set their own national targets, though none have officially done so.

Data quality: scores for each question are ideally consolidated in country-led, multi-stakeholder processes (section 1.4 and annex 1). For each of the 33 questions, countries also provide the "status description" and "way forward". The reporting processes add to the transparency and confidence in results, and the completed surveys can be used as simple diagnostic tools to determine the main challenges and opportunities in each country, as well as outlining next steps towards the target.[31]

1.6 Sub-regional analyses

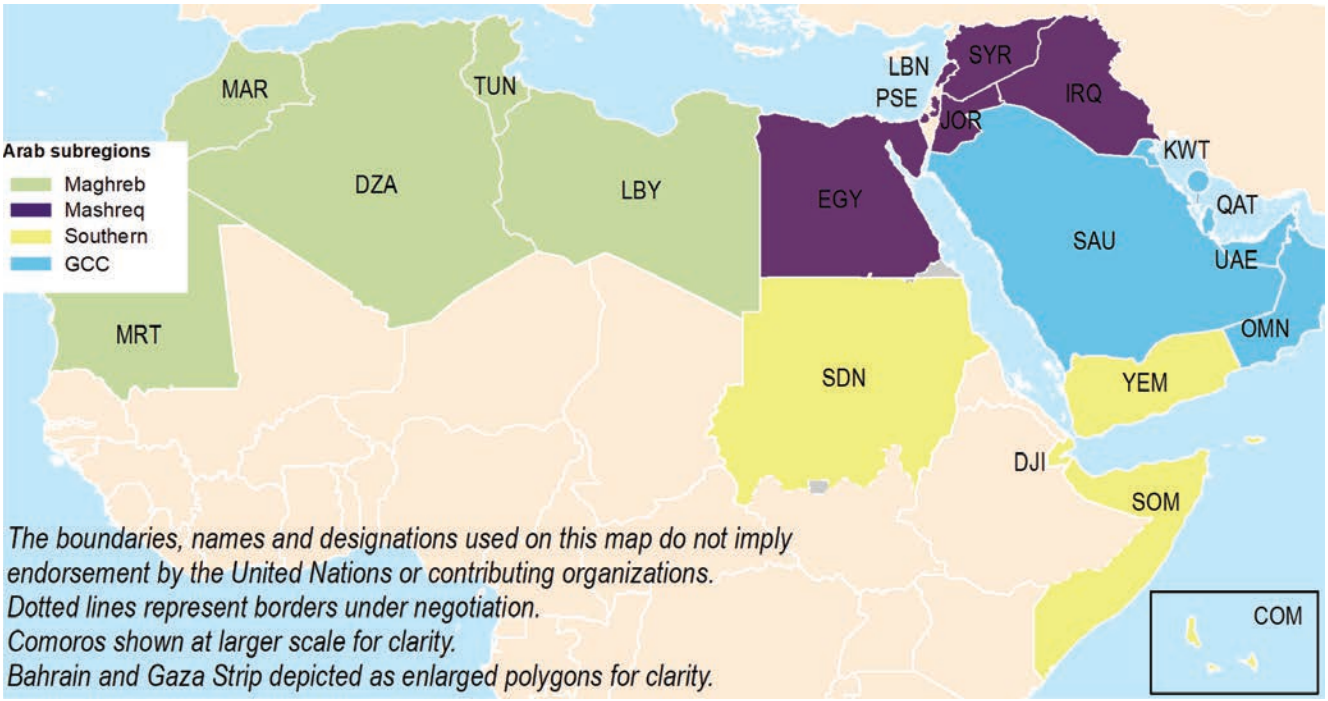
In addition to the regional and national levels, the IWRM implementation results are also aggregated at the sub-regional level. It is hoped to draw lessons from countries with similar social, economic, political and/or geographic contexts (figure 1.3). Analysing results for the four Arab sub-regions facilitates coordination and prioritization.

The four sub-regions have been defined for the purposes of this report. The clearest ties are found in the GCC of which all the countries are members. Similarly, all the Maghreb countries belong to the Arab Maghreb Union. The Mashreq countries are more strongly linked through geographic and historic bonds even though various levels of cooperation

exist among them. The Southern Arab countries have comparable levels of socioeconomic development as illustrated by similar Human Development Index (HDI) and Multidimensional Poverty Index (MPI) scores.

The overall level of IWRM implementation at the sub-regional level is presented in section 2.2, and sub-regional analyses across the four dimensions of IWRM, and their underlying 33 elements, are presented throughout chapters 3 and 4.

Figure 1.3 Four sub-regions of the Arab region



1.7 Structure of the report

This report presents the country and regional status and trends regarding IWRM implementation (indicator 6.5.1) as well as the progress made between 2017 and 2020 towards the 2030 target. It is part of a set of products to track progress and support countries in working towards SDG 6.5 target, including country factsheets, country action plans, and regional reports.[32] The report is subdivided into five chapters, in addition to annexes:

- **The setting:** chapter 1 starts with an introduction of water resources management in the 2030 Agenda and a description of the impact of COVID-19 on IWRM implementation. It outlines the data collection and indicator calculation methodology.
- **Overall status and progress of IWRM implementation:** chapter 2 presents the main findings of SDG 6.5.1 indicator at the national and sub-regional levels. It also assesses likely progress towards target 6.5 and related Arab political commitments.
- **Implementing elements of IWRM:** chapter 3 details the four main dimensions of IWRM, including results from individual questions in each dimension.
- **Supporting Arab regional priorities:** chapter 4 presents the degree of implementation of IWRM elements as they relate to two main Arab regional priorities, namely groundwater management and cooperation over shared water resources.
- **Accelerating full implementation of IWRM:** chapter 5 analyses some of the main constraints and enablers to implementing IWRM as well as some guidance on how results can be used to foster dialogue and action in the region.

2

Overall status and progress of IWRM implementation

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Key findings and recommendations

1. The average implementation of IWRM in the Arab region is 53 out of 100 (medium-high implementation), similar to the global average of 54. **Given the centrality of integrated water management for water security and sustainable development in this water-scarce region, as recognized by the ASWS (2010-2030), it is recommended that the implementation of IWRM is accelerated in most countries as the business-as-usual approach will not suffice with the mounting challenges**.
2. Nine Arab countries with medium-low or low IWRM implementation are unlikely to meet the global target in 2030 unless progress is significantly accelerated. **Countries should strengthen the political will across all sectors, including the finance ministry, and set national interim targets to facilitate implementation.**
3. The regional average masks a wide variation in IWRM scores of countries from 20 (low level) to 94 (very high level). **Opportunities for peer-to-peer capacity building should be explored and facilitated by regional and sub-regional bodies, to prioritize and advance the status of IWRM in those countries with the lowest capacity.**
4. Between 2017 and 2020, nine Arab States improved their level of IWRM implementation while six witnessed limited progress. The Arab region is far from achieving the target and the current regional rate of implementation urgently needs to double. **Therefore, cooperation and experience sharing are needed within the region. Some support from sub-regional and regional organizations and institutions should also be sought.**
5. At the sub-regional level, the GCC has the highest average IWRM implementation score (72), followed by the Maghreb (58), the Mashreq (48) and the Southern countries (28). Between 2017 and 2020, the three first sub-regions substantially increased their level of IWRM implementation, while the Southern sub-region witnessed limited progress. **Therefore, there is a need to give particular attention to the four Southern countries, use opportunities for peer support, and build sub-regional collaboration mechanisms and strengthen those that exist.**

The general interpretations of the implementation categories for the overall indicator 6.5.1 score are based on the threshold descriptions from the individual questions and are presented in chapter 1 (table 1.1). Some questions are further discussed in chapters 4 and 5.

By 2030, a global aspirational target has been set to reach a very high degree of implementation (average score between 91 and 100) for indicator 6.5.1 in line with target 6.5 on implementing IWRM at all levels, including through transboundary cooperation. Given that some Arab countries have generally lower levels of IWRM development, it is recommended that they set national targets, guided by the global level of ambition, while taking into consideration the national circumstances for each country.

2.1 Regional and country status and progress

15 Arab countries reported for the second time in 2020, following baseline reporting in 2017, allowing for progress to be measured towards target 6.5 (section 1.3). Out of these 15 countries, nine increased their level of IWRM implementation (five substantially and four moderately) and six witnessed limited progress during the 2017-2020 period. It is worth noting that Qatar, which is one of the six countries, is already in the high implementation category and thus limited progress is not a bad indicator. This result needs a lot of improvement as the Arab region is far from achieving the target and the current regional rate of implementation needs to double to reach the 2030 target. While the regional score on indicator 6.5.1 represents a medium-high degree of IWRM implementation (score of 53), there are huge variations between countries, with the reported SDG 6.5.1 scores ranging from 20 (low level) to 94 (very high level). Therefore, special efforts and investments must be made to close the gap between current practices and the required trajectory to achieve full implementation. Failure to accelerate IWRM implementation, in this water-scarce region, threatens its ability to balance the social and economic demands on water, and hence the achievement of other SDG targets, such as those on water supply and sanitation, sustainable agriculture, energy, pollution, and water-related ecosystems, to name but a few.

The number of countries that reported very low to medium-low levels of IWRM implementation (red – yellow) decreased from 12 out of 19 (63 per cent) in 2017 to nine out of 21 (43 per cent) in 2020 (figure 2.1). The number of countries in the higher levels of IWRM implementation (green – blue) increased from seven (37 per cent) to 12 (57 per cent).

Figure 2.1 Degree of IWRM implementation and level of progress towards the target between 2017 and 2020

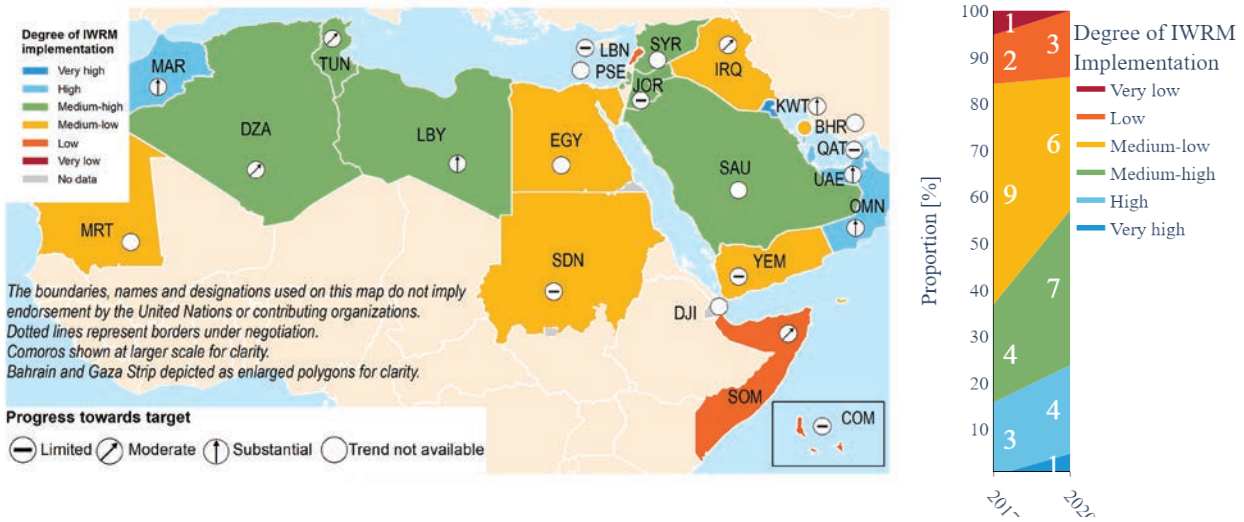


Table 2.1 Distribution of 6.5.1 scores per IWRM implementation category in the Arab region across 2017 and 2020

2017	2020		2020 Status	Towards 2030
0 (0%)	1 (5%)	Very high 91-100	1 country is generally achieving IWRM objectives and is periodically reviewing and revising processes.	5 countries are likely to meet the global target if momentum is maintained.
3 (14%)	4 (21%)	High 71-90	4 countries are generally achieving policy objectives for IWRM with good geographic coverage and stakeholder involvement.	
4 (19%)	7 (37%)	Medium-high 51-70	7 countries are implementing most IWRM elements in long-term programmes.	7 countries would potentially be able to reach the global target, but efforts need to be focused and sustained.
9 (43%)	6 (32%)	Medium-low 31-50	6 countries have institutionalized most IWRM elements and implementation is under way, but implementation of arrangements is not widespread.	9 countries are unlikely to meet the global target unless progress is significantly accelerated. They should aim to set national targets based on the country context.
2 (10%)	3 (16%)	Low 11-30	3 countries have started developing IWRM elements with limited implementation across countries and potentially low stakeholder participation.	
1 (5%)	0 (0%)	Very low 0-10		

In 2020, nine countries still reported medium-low or low IWRM implementation levels, indicating that while some IWRM policies, laws, plans and institutional arrangements may be in place, implementation in practice is limited in these countries. This is often due to the low capacity of the actors mandated to implement IWRM, insufficient geographic coverage for management arrangements and limited stakeholder participation in water resources management (lack of IWRM integration). Four countries reused their baseline submission from 2017 and their 2020 submission, and therefore no further stakeholder consultation was undertaken in 2020.[33] Egypt submitted a revised report in late 2021, after the official deadline for the second reporting round and thus the actual survey results could not be included in this report but do reflect progress in implementing IWRM (box 2.1).

Box 2.1 Progress of implementation of IWRM in Egypt (unofficial second round reporting)

Enabling environment: the Ministry of Water Resources and Irrigation (MWRI) prepared the Water Resources Development and Management Strategy for 2050 in 2011 and updated it in 2017. This Strategy is consistent withthe 2037 National Water Resources Plan (NWRP) and emphasizes two strategic concerns, namely climate change adaptation and higher-level water management. It is based on four pillars aimed at improving water quality, water availability, water use and IWRM enabling environment.

15 outcomes and related measures and indicators were defined. The outlines of a decentralized governing system at all levels, including the 27 governorates, the administration and water users, were specified.

Institutions and participation: the 2037 NWRP has been prepared based on IWRM principles and provides the ministries and concerned parties with decision-making general principles. A strong coordination platform has been established, including representatives from relevant stakeholders at the national and local levels. The private sector is encouraged to invest in water-related projects. A set of measures and indicators are defined to evaluate performance and progress in implementing the NWRP, including measures for human resource development and capacity building. Egypt participated in many projects of mutual benefit to all Nile Basin States.

Management instruments: the MWRI provides decision-makers with real-time and accurate data and information through up-to-date information and communications technology tools to help manage and monitor water quality. A water quality index has been developed, under the European "Union Water STARS Project. Measures were also taken to strengthen disaster risk management. The MWRI has established groundwater monitoring programmes to avoid aquifer overexploitation. Some programmes are under way to make the water management database available at the directorate and district levels by providing well-trained staff, training opportunities, technical support, software and equipment. Data and information on transboundary water are regularly shared between Egypt and the Sudan programmes are under way to make the water management database available at the directorate and district levels by providing well-trained staff, training opportunities, technical support, software and equipment. Data and information on transboundary water are regularly shared between Egypt and the Sudan.

Financing: the MWRI still relies on governmental funds for water project financing. It is trying to collect fees from commercial institutions for provided services and studying the possibility to improve cost recovery for irrigation and other services. Some initiatives are taken to enhance the private sector participation, through incentives, and maximize international partnerships and contributions to infrastructure projects. The 2037 NWRP aims to improve water quality, rationalize water use, enhance the availability of freshwater and improve IWRM enabling environment. Full cost recovery for municipal water supply and sanitation services is targeted to enable the sustainability of services. Egypt supports Nile riparian countries through a specialized fund exceeding $100 million to implement water projects, with good progress in the Democratic Republic of the Congo, Kenya, South Sudan, the Sudan, Tanzania and Uganda.

In order to accelerate IWRM implementation in the region and achieve the 2030 objective, there is a need to adopt some enablers, among other country, sub-regional and regional level measures (box 2.2).

Box 2.2 Main enablers for the acceleration of IWRM implementation in the Arab region

a. Strengthening the political will at all levels, including at the highest level and at the finance ministry, by communicating the value of implementing IWRM for multiple development objectives.

b. Strengthening the political will across sectors, engaging actors across sectors and reinforcing the collaboration mechanisms in practice (i.e. agriculture, energy, environment and urban development).

c. Aligning with climate mechanisms, including on financing, but this also supports the above two enablers, as climate tends to have greater political attention, and is already seen as a cross-cutting issue.

2.2 Sub-regional implementation of IWRM

At the sub-regional level, the GCC region scores higher than the other regions (72), with all its implementation dimensions in the high level except for the enabling environment, which is in the medium-high level (table 2.2). The Maghreb countries are second with an average score of 58 with management instruments (55) and financing dimensions (57) lagging behind other dimensions. The Mashreq countries are third with an average score of 48, with the financing dimension being on a low level (32). The Southern Arab countries are lagging with an average implementation level of 28. Their management instruments (27) and financing (15) dimensions are in the low level of IWRM implementation. These findings relate closely to the HDI scores of 0.844 and 0.515 for the GCC and Southern sub-regions, respectively.

Regarding progress between 2017 and 2020, the GCC sub-region, which presents the highest average implementation of IWRM (72) in 2020, has made substantial progress towards achieving the SDG targets (table 2.2).

Kuwait and Oman were able to move from high to very high and from medium-low to high levels between 2017 and 2020, respectively. The Maghreb and Mashreq sub-regions made moderate progress and need to accelerate their IWRM implementation level. All the Maghreb countries were able to improve their scores between 2017 and 2020 with Libya moving from medium-low to medium-high and Morocco from medium-high to high levels. In the Mashreq, Iraq made substantial progress on all four IWRM dimensions between 2017 and 2020 and moved from low to medium-low but the progress of Lebanon was limited. It should be noted that the 2020 score of Lebanon is likely to be more accurate compared to 2017 because the reporting process on indicator 6.5.1, led by the Ministry of Energy and Water, involved an extensive consultation process in 2020, which was not the case in 2017. The Southern sub-region lags significantly behind and has maintained its 2017 average score of 31 (medium-low) in 2020. Only Somalia, in this sub-region, was able to make substantial progress on IWRM implementation (low to medium-low levels), yet it needs to focus on the institutions and participation dimension, for which it has made moderate progress only.

It is worth noting that the sub-regional averages may mask important variations between country-level results, like between Bahrain and Kuwait in the GCC with scores of 39 and 94, respectively. Yet, they give an important indication of where sub-regional organizations, like the GCC Supreme Council, can work together and find innovative ways to support and accelerate IWRM implementation.

In fact, the GCC Supreme Council endorsed the GCC Unified Water Strategy (2016-2035), in which one of the strategic objectives was the improvement of governance to achieve effective IWRM.[34] The implementation of IWRM requires water actors and stakeholders to recognize the importance of cooperation and experience sharing. They need to work closely with their upstream and downstream neighbours, and achieve the sustainable management of water resources within their borders. Regional bodies, such as transboundary river basin organizations, can make an important contribution to sustainable resource management in all riparian countries.

These IWRM implementation scores seem to be in conformity with the pattern of sub-regional HDI for the two extremes, namely the GCC (IWRM 83, HDI 0.844) and the Southern sub-region (IWRM 28, HDI 0.515). There appears to be some link between the overall level of socioeconomic development and political stability and the degree of IWRM implementation. However, this correlation is not evident for the Maghreb (IWRM 61, HDI 0.689) and Mashreq (IWRM 42, HDI 0.688) sub-regions. Despite comparable HDI values, the average IWRM implementation in the Maghreb is one level higher than that of the Mashreq. The HDI is based on three dimensions related to health, education and standard of living.[35] In theory, if a country has the capacity to implement measures relating to health and education, then it may also have the capacity to implement IWRM, although countries are likely to prioritize direct health and education measures.[36] A study of the IWRM implementation level versus HDI in the Arab region showed that the correlation was not strong, particularly for countries with medium and high HDI (i.e. in the middle).[37] This implies that the level of IWRM implementation is likely to be influenced by other factors, such as the level of priority given to water resources management in a country.

In the GCC sub-region, the Supreme Council can foster dialogue and knowledge sharing to provide the support needed to meet targets. For the other sub-regions, such a cooperation body is lacking but regional organizations, such as the AMWC or ESCWA, can play this role to support knowledge exchange at the sub-regional level.

For the Maghreb sub-region, the acceleration should focus on practical management instruments and tools that complement and operationalize the institutional and policy frameworks allowing for accelerated implementation through monitoring, data and information sharing and improved integrated decision-making.

For the Mashreq sub-region, acceleration is needed in terms of increased financing to the water sector, which may be facilitated through an increased political will and by engaging finance ministries in mainstreaming water issues in national priorities and highlighting the multisectoral socio-economic benefits of the water sector.

For the Southern sub-region, the most pressing accelerator is financing, which needs support beyond the sub-region, such as from the GCC, and through targeted development financing provided through bodies such as the World Bank, the Islamic Development Bank or the Kuwaiti Fund, among others. Capacity development through knowledge exchange with other sub-regions may be fostered through regional organizations.

Table 2.2 Implementation scores of the 21 countries and 2017-2020 progress by the 15 reporting countries of the Arab sub-regions across the four IWRM dimensions

Dimension	GCC	Maghreb	Mashreq	Southern	Arab region
1. Enabling environment	63	59	57	39	56 (27-90)
2. Institutions and participation	78	63	51	32	58 (19-100)
3. Management instruments	75	55	50	27	54 (10-90)
4. Financing	71	57	32	15	46 (27-90)
Average	**72**	**58**	**48**	**28**	**53 (7-100)**
2017	68	53	40	29	48 (10-82)
2020	72	58	48	28	53 (7-100)
Progress	Substantial	Moderate	Moderate	Limited	Moderate
HDI (2019)	0.844	0.689	0.688	0.515	0.700 (0.470-0.890)

Source: UNDP, Human Development Report (New York, 2020) (for the HDI).

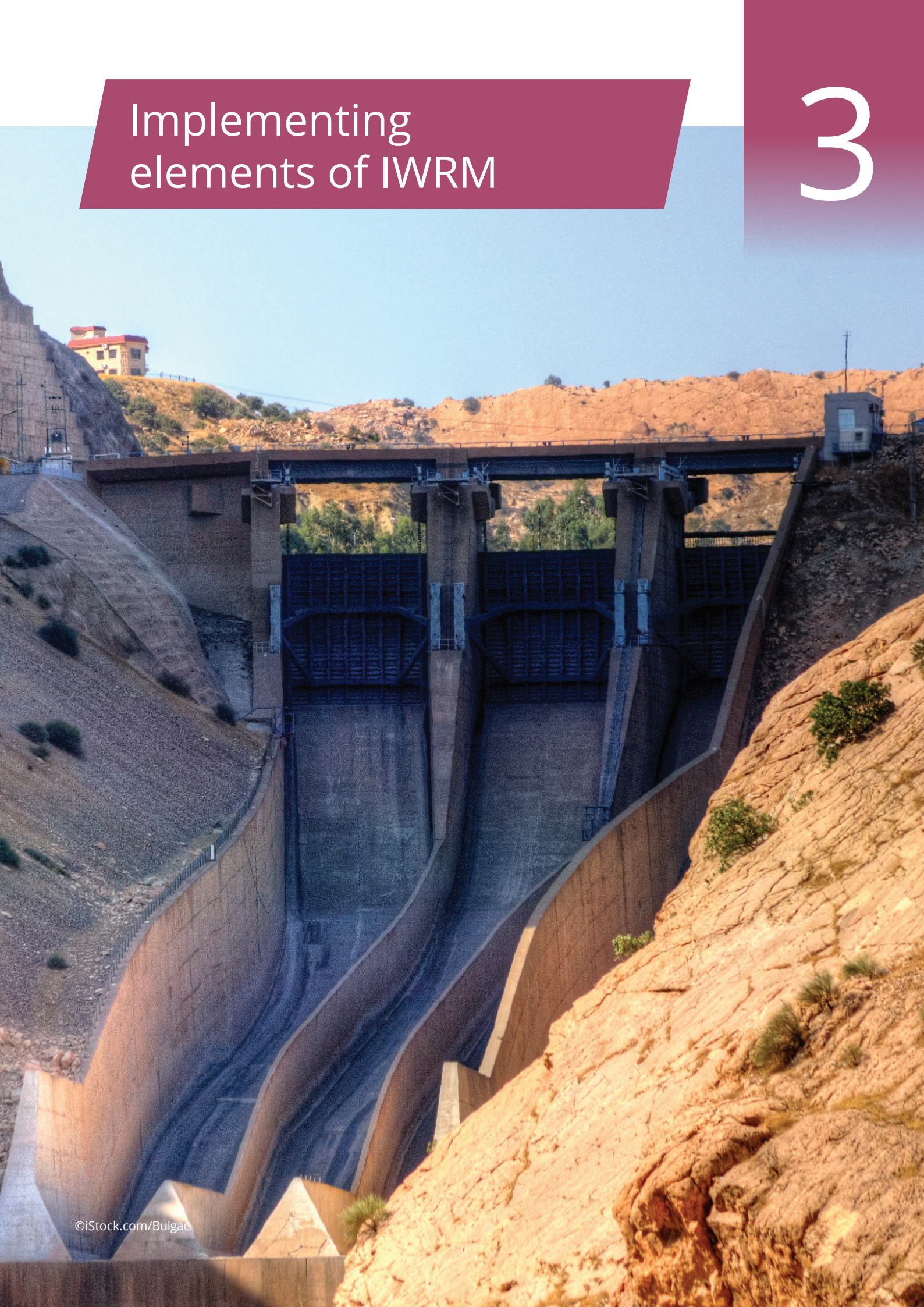
2.3 Constraints and priorities identified by countries

The 21 reporting countries in the Arab region, through their responses to the surveys for SDG indicator 6.5.1, have put forward the main constraints that they are facing in applying IWRM principles to the various aspects of water management. These also constitute the priority areas they need to address to progress towards full IWRM implementation.

- **Water scarcity and climate change:** the well-known challenges linked to water scarcity and the adverse effects of climate change on water resources were emphasized by countries. Accelerated aridity, drought and flood damage all impact IWRM implementation. Countries also mentioned the difficulty of depending on fluctuating annual rainfalls with limited water resources in the face of growing water demand. Countries in the region need to achieve a balance between water use and renewable resources, preserve water resources from depletion and pollution, and re-balance supply and demand by enhancing water resources mobilisation.
- **Water pollution:** the phenomenon of salinity and the deterioration of groundwater quality in the coastal regions was also identified among the challenges to be addressed.
- **Financing:** this dimension exhibits the lowest level of IWRM implementation in the region (medium-low, 46) and insufficient financial resources were the most common constraint raised by countries. The specific challenges that were identified include the difficulty to mobilize funds on time, the insufficient governmental budgets for management and investment, the unavailability of financial resources at the basin level, the limited ability to collect the fees for water use from municipalities and the dependence of some countries on international funds. Most of the Arab countries need to improve funding mechanisms and involve the finance ministry in the planning and management of water resources.
- **Advocacy and political will:** some countries report a lack of knowledge and weak understanding of IWRM concepts even at high governmental and strategic levels. More awareness and advocacy are needed to rationalize the use, protect available water resources and reduce irrigation water losses in the agricultural sector.
- **Cross-sectoral coordination:** the multiplicity of stakeholders in water management, the large distribution of tasks and responsibilities related to water resources management between institutions at the local and federal/basin levels and the need for the highest levels of coordination and integration between the various water-related agencies were identified as major constraints to IWRM implementation.
- **Legal framework and law enforcement:** some countries pointed out the slow implementation of laws based on IWRM principles, the difficulties in law enforcement, and failure to respect water legislation. They also mentioned the issue of indiscriminate drilling and withdrawal of groundwater without official approval.
- **Capacity building:** the limited technical and institutional capacity of water professionals and organizations is a barrier to implement IWRM. There is a big gap in knowledge, expertise and capacity in water resources management both for quantitative and qualitative aspects, including river basins and aquifers. In some countries, the vast territory and inequitable geographic distribution of water resources limit the institutional capacity for water management. The capacity to mobilize water, especially in times of drought, and achieve compatibility between water security and food security was also mentioned. In addition, the lack of tools and methodologies to identify problems, challenges, potentialities and constraints in terms of planning and management also hinders IWRM implementation.
- **Monitoring, data sharing and knowledge management:** some countries reported the lack of monitoring and evaluation systems and sustainable performance indicators. There is also a need for sharing mechanisms between countries that will support the exchange of data leading to the progress of IWRM implementation.
- **Basin management:** among the identified constraints is the encroachment on rivers and water quotas for agricultural use as well as the need for the implementation of integrated programmes for the rationalization and management of water resources at the level of water basins, the modernization of management tools and integration of new technologies, and the appropriation of watershed protection by local residents.
- **Political situation:** some Arab countries referred to their vulnerable political situation, such as occupation, war and economic sanctions, as the main constraint for IWRM implementation.

Implementing elements of IWRM

3



This chapter is structured around the level of implementation across the four IWRM dimensions, namely: (1) enabling environment (policies, laws, plans); (2) institutions and stakeholder participation; (3) management instruments; (4) financing for IWRM. In addition, it reports on the analysis of the 33 individual questions from the questionnaire on IWRM elements. The IWRM aggregate implementation scores for each dimension and their underlying elements indicate those that are relatively advanced and those that need improvement. The questions related to groundwater resources management and cooperation on shared water resources are discussed in chapter 4.

The scores of the Arab region for each of the four IWRM dimensions are close to the world averages in 2020 (figure 3.1). The highest implementation scores are in the medium-high level for institutions and participation (58), enabling environment (56) and management instruments (54). The lowest scores are recorded for financing (46). This indicates that decision-makers are aware of the importance of the enabling conditions, which include policy, legal and strategic planning, the participatory approach by the different institutions and stakeholders as well as the tools and methods to use when making choices between different actions. More attention should be given to the insufficiency of financial resources, which may hinder the full IWRM implementation.

A comparison of the 2020 scores with those of 2017 indicates that, on average, the Arab region is doing well in terms of enabling environment, institutions and participation, and management instruments. This means that it is almost on track to meet the 2030 target. However, the performance of the region needs urgent improvement in financing. The region needs to improve the rate of progress, which may require more investment efforts to close the gap between the current implementation practices or business as usual and the required trajectory to achieve full IWRM implementation by 2030.

The average scores should not hide the realities of different countries, with average national scores for the four dimensions ranging from 7 to 100 (figure 3.2). This demonstrates the need for each country to carefully assess its own strengths and weaknesses for progressing with IWRM implementation.

Figure 3.1 Average implementation of the four dimensions of IWRM in the Arab region and the world

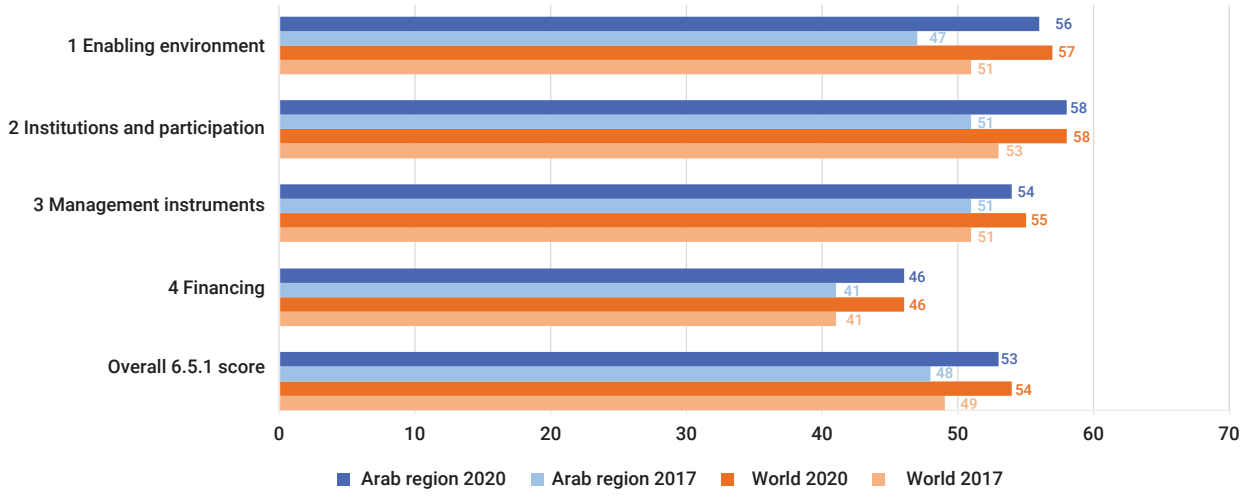
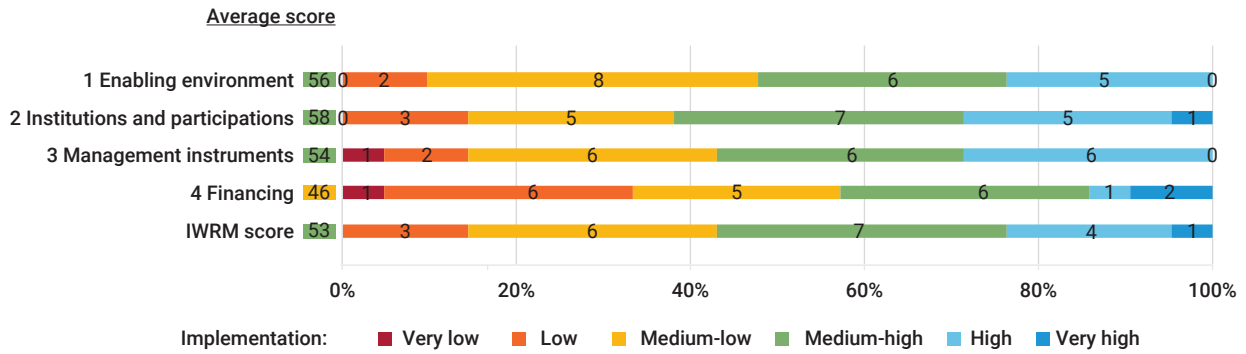


Figure 3.2 Number of countries per implementation level across the four dimensions of IWRM in the Arab region



3.1 Developing and implementing laws, policies and plans

Key findings and recommendations

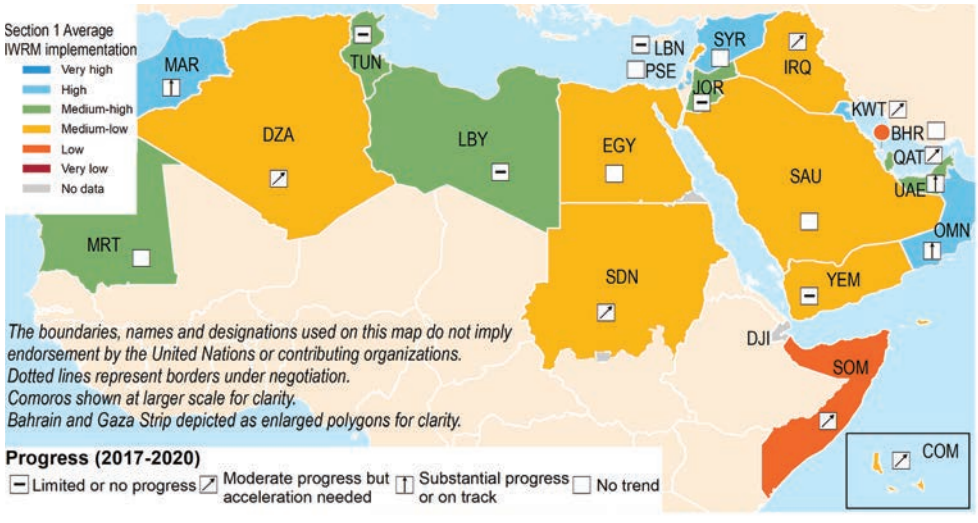
1. Out of 21 countries, 12 have the capacity to adequately implement IWRM-related laws, policies and plans under long-term programmes (on average, medium-high level). **Some countries need to strengthen implementation activities of their IWRM laws, policies and plans.**

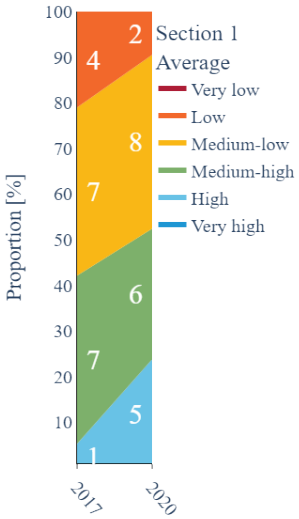
2. The average implementation of five out of the seven elements (questions) in the enabling environment is in the medium-high range (52-60). However, average progress is lower for subnational regulations (48) and transboundary agreements (46). **Arab States should increase efforts to improve the enabling arrangements and frameworks for better transboundary water resources management and cooperation as this has been expressed as a regional priority in the ASWS.**

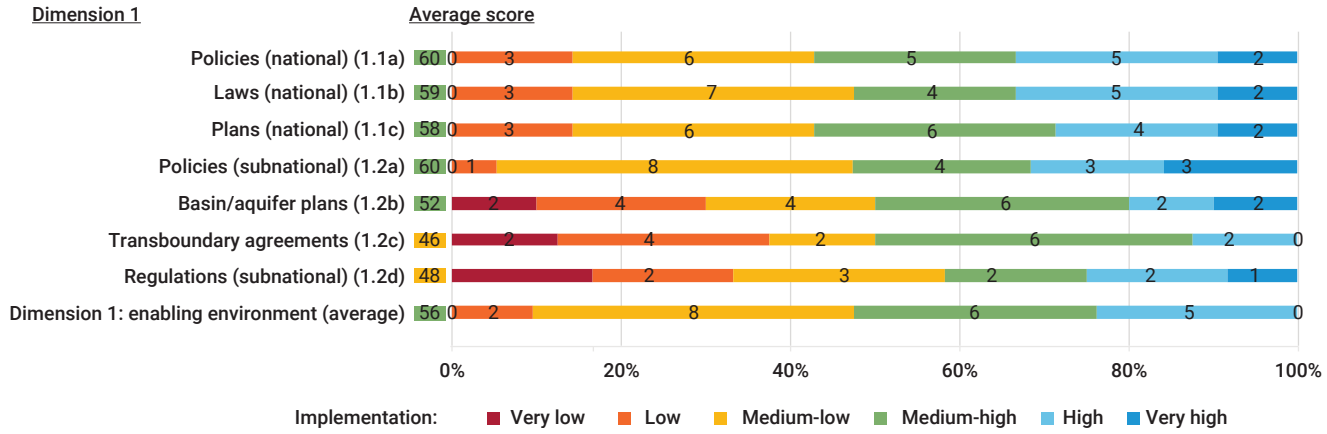
3. The Southern sub-region has the lowest average score (43) for the seven enabling environment elements, which is 13 points lower than the regional average (56). **To accelerate IWRM implementation in the Arab region, the Southern sub-region needs to strengthen political will and invest substantive efforts in the development of laws, policies and plans. Some support may be welcome from the other sub-regions and from regional organizations, through knowledge exchange and capacity development.**

4. On average, the Arab region has made good progress on implementing IWRM enabling environment elements between 2017 and 2020. **This positive result should not hide the fact that several countries need to work on improving their implementation rates.** At the country level, three made substantial progress, seven showed moderate progress, while five had limited or no progress. **Regional organizations need to intensify their efforts and explore advanced means to support IWRM implementation through long-term tailored programmes.**

Figure 3.3 IWRM implementation status, per country, of enabling environment and percentage of countries per level of implementation, 2017 vs 2020







The Arab region is witnessing a significant and increasing water scarcity situation compounded by over-consumption by all sectors. In addition, the non-sustainable exploitation of this very vital resource leads to deterioration of its quality. Luckily enough, all countries of the region have acknowledged that efficient management of water resources is key to future development, growth and stability as identified in the ASWS. They are considering water as a national priority and promoting its governance through the implementation of IWRM.

In many cases, the enabling environments for water management and their implementation are fragmented between different ministries or institutions, such as water, agriculture, irrigation, health, environment and local authorities. The challenge for all is to find the right framework and synergies that would allow for the implementation of IWRM in a participatory and coherent approach.

The enabling environment dimension refers to the creation of laws, policies and plans to support the implementation of IWRM. The extent of its implementation is measured at the national level and at other subnational and transboundary levels. An enabling environment would be successful when national and subnational policies and laws outline the importance of integrated approaches to water resources management and garner the political will to advance on them.

The average score for this dimension in the Arab region indicates a medium-high (56) degree of implementation, which can be interpreted that, on average, the region has adequate capacity to implement IWRM under long-term programmes. This average should not hide the fact that some countries have just started implementing IWRM as the range of country scores varies from low (27) to high (90) with 48 per cent of the countries scoring at medium-low and low levels. The average score of the dimension is very close to the world average (57).

Out of the 15 countries that reported in both 2017 and 2020, three countries (Morocco, Oman, and the United Arab Emirates) made substantial progress and seemed to be on track for achieving the 2030 objectives, seven countries showed moderate progress and need to accelerate their level of IWRM implementation, while five countries had limited or no progress (figure 3.3). On average and in general, the Arab region has made good progress on implementing IWRM enabling environment elements between 2017 and 2020. The trend has been positive for all the seven elements of the dimension. However, this result should not hide the fact that several countries need to work on improving their implementation rates.

Around half of Arab countries (11 out of 21) have the capacity to adequately implement IWRM elements related to laws, policies and plans under long-term programmes (on average, medium-high implementation).

The difference between the average of scores at the national level (59) and the other levels (54) shows that there is a need in countries that already have policies, laws and/or plans at the national level to transfer their knowledge from central governments to local and/or basin entities. In fact, the least progress, among the seven elements of the enabling environment dimension, is on transboundary arrangements and provincial laws (medium-low), noting that the transboundary and provincial dimensions may not be applicable to all reporting countries.

The policies, laws and plans in most Arab countries are in place at the national level. Aware of the challenges associated with the management of water resources and the need to ensure access for all to drinking water and sanitation, most of the countries in the region have developed these enabling environment elements. Some of them established these as early as the 1980s (for example, Algeria and Egypt). Others have been undergoing institutional reforms establishing new policies and instruments to accelerate the implementation of IWRM (for example, Morocco and Yemen). Most of the countries have promulgated policies/laws and established strategic plans for water management starting 2000. Saudi Arabia, for example, developed a national water strategy with specific objectives for 2030 (box 3.1). However, some countries are still in the process of establishing a water management strategy.

Some of the challenges are the effective implementation with monitoring or evaluation mechanisms to measure progress as well as coordination between the numerous institutions and stakeholders involved in water management and use (ministries, local administrations, civil society, private sector and water users). The Sudan reported that water plans were slowed down and even stopped for three months because of COVID-19 outbreak. Several projects and ideas were reported by different countries as ways forward including, preparing application decrees for water laws, updating laws and legislation periodically, including other sectors in the vision, linking food and water security, building capacities and encouraging scientific research, investing in modern technologies, developing and strengthening awareness programmes, enhancing private sector participation, drawing benefits from regional and international expertise and experiences, strengthening monitoring and evaluation systems, and establishing aquifer and catchment contracts. Some countries reported about building a long-term vision, based on IWRM principles, for the management of their water resources (for example, Oman,[38] 2040, Morocco[39] and Tunisia,[40] 2050).

At the other levels, transboundary arrangements and provincial laws have the lowest scores of the countries in the region. This may be explained by the lack of specific institutional mechanisms and cooperation for the management of transboundary and provincial water. Some countries proposed the possibility to put in place consultation mechanisms or agreements for the management of transboundary waters. Other countries reported that these levels were not applicable for them due to the lack of transboundary water resources or provincial structure.

At the country level, Oman distinguishes itself by reaching high and very high levels of implementation in the six IWRM elements that apply to it. Similarly, Kuwait and the State of Palestine have reached high and very high scores in five elements but need to work on improving transboundary arrangements for which they scored at the low level (20). Additionally, Kuwait and the State of Palestine have fully implemented the enabling environment at the national level with five other countries (Jordan, Morocco, the Syrian Arab Republic, Tunisia and the United Arab Emirates) presenting good performance in this area. Except for the United Arab Emirates (medium-high), the other six countries are doing well on most of the subnational elements (very high or high).

On the other hand, Bahrain and Somalia may have started the IWRM implementation of elements pertaining to the enabling environment but it seems from their scores (low level in general) that they need more engagement of stakeholders and country coverage. It is worth noting that the Bahraini Council of Ministers adopted a national strategy for water and its executive plan for 2030 on 1 February 2021. However, this is not reflected in the current score as Bahrain did not submit an updated report in 2020. Eight countries (Algeria, the Comoros, Egypt, Iraq, Lebanon, Saudi Arabia, the Sudan and Yemen) need to accelerate the IWRM implementation of this dimension. These significant variations between Arab countries for implementing the enabling environment elements should provide opportunities for collaboration and sharing of ideas and experiences.

Considering the enabling environment in the Arab sub-regions (table 3.1), the GCC, the Maghreb and the Mashreq score in the middle of the medium-high level (60 on average), which indicates the capacity of these sub-regions to put in place adequate conditions that help support the implementation of IWRM.

Box 3.1 National Water Strategy in Saudi Arabia, 2030

Saudi Arabia is facing serious challenges because of its arid climate and the unsustainable use of water resources. Its water needs, which were 24.8 billion cubic meters in 2015, are steadily growing at 7 per cent per year. Agriculture accounts for 84 per cent of total water abstraction and up to 25 per cent of urban water is lost in the networks. The reliance on desalination and water subsidies are imposing a heavy burden on the Saudi economy. Besides, the institutional conditions and governance mechanisms need to be improved. To overcome these challenges, the Ministry of Environment, Water and Agriculture has developed a national water strategy with specific objectives for 2030. A three-phase approach was used with wide stakeholder participation, namely diagnosis, strategy definition and implementation planning. The used framework consisted of five strategic objectives, three strategic elements and five strategic enablers. It was structured into 10 strategic programmes: (1) water law and regulations, (2) water resource management, (3) sector resilience, (4) research, innovation and capability building, (5) supply chain efficiency and service quality, (6) water services regulations, (7) saline water conversion corporation reconstructing, (8) private sector involvement in production and wastewater treatment, (9) distribution restructuring and privatization, (10) restructuring of the Saudi Irrigation Organization and improvement of irrigation.

Source: Saudi Arabia, Ministry of Environment, Water and Agriculture, ***2030 National Water Strategy*** (2019).

Table 3.1 Scores of the seven enabling environment elements in the Arab sub-regions (with the lowest and highest values between parentheses)

1. Enabling environment	GCC	Maghreb	Mashreq	Southern	**Arab region**
1.1 National level					
(a) Policies	62	64	68	38	60 (20-100)
(b) Laws	60	66	67	38	59 (20-100)
(c) Plans	65	54	67	40	58 (20-100)
1.1 Average	**62**	**61**	**67**	**38**	**59 (20-100)**
1.2 Other levels					
(a) Subnational policies	80	64	53	45	60 (20-100)
(b) Basin/aquifer plans	73	38	47	40	52 (10-100)
(c) Transboundary agreements	28	65	45	50	46 (0-80)
(d) Subnational regulations	90*	50	48	17	48 (0-100)
1.2 Average	**65**	**56**	**49**	**41**	**54 (33-73)**
Dimension 1 average	**62**	**59**	**57**	**39**	**56 (27-90)**

* Two countries: Oman and the United Arab Emirates.

The GCC scores higher on most elements than the other sub-regions, except for the transboundary elements where it scores the lowest of all. This low score may be explained by the fact that this element is not applicable to two countries (Oman and Qatar) and Bahrain reported that there were no arrangements for transboundary water management (score = 0). The GCC Supreme Council issued in its thirty-first summit (2010) a directive for a long-term comprehensive Gulf water strategy to be elaborated and implemented. In 2016, the GCC Unified Water Strategy (2016-2035) was elaborated by the GCC Secretariat General and approved by the GCC Supreme Council (box 3.2).

The Southern sub-region scores mostly at the medium-low level, with a low score for provincial laws (26). Somalia and the Sudan reported the existence of water policy and regulation at the subnational level, but these are not yet generalized and not based on IWRM. There is a need to harmonize existing water laws at the subnational level and coordinate them with national water laws.

Box 3.2 The Unified Water Strategy (2016-2035) of the Gulf Cooperation Council

The GCC countries have been able to provide water for the increasing population and rapidly expanding economies by resorting to costly investments in water supply sources and infrastructure, including desalination, water treatment, dam construction and groundwater abstraction. In order to face the many challenges that are threatening the water sector sustainability and ensure water continuity, there was a pressing need to establish efficient and sustainable water management systems. Therefore, the GCC Supreme Council issued in its thirty-first summit (2010) a directive for a long-term comprehensive Gulf water strategy to be elaborated and implemented. In 2016, the GCC Unified Water Strategy (2016-2035) was elaborated by the GCC Secretariat General and approved by the GCC Supreme Council. The strategy included a vision, a mission, values, strategic themes, strategic objectives and their policies and targets with key performance indicators (KPIs). It is built on five strategic pillars, which reflect the vision and mission statements, namely water development and sustainability, efficient and equitable use, enhanced municipal supply security, effective governance and awareness, and economic efficiency and financial sustainability. These pillars are based on four cross-cutting themes that are related to capacity development and training, research and development, environment and ecology, and climate change. A strategic plan has been developed for each policy, programme and activity with defined owners, timeline, milestones and targets. The execution plan contains 82 KPIs to monitor the success of the strategy implementation.

Source: Al-Zubari W. and others, "An overview of the GCC Unified Water Strategy (2016-2035)".

3.2 Establishing institutions and engaging stakeholders

Key findings and recommendations

1. The Arab region's overall performance in establishing institutions and engaging stakeholders for IWRM implementation is similar to the global average at a medium-high level (58). Nevertheless, wide disparities exist between sub-regions with the highest average score recorded for the GCC (78) and the lowest for the Southern sub-region (32). **It is highly recommended to strengthen cooperation between sub-regions to disseminate good practice and share experiences for this dimension. At the national level, increased political will and commitment to establishing and empowering institutions with clear mandates are needed along with clear mechanisms for empowering and engaging relevant stakeholders in all stages of IWRM planning and implementation.**
2. In general, countries in the Arab region have made good progress between 2017 and 2020 in implementing IWRM institutions and participation (score increased from 51 to 58). Seven countries made substantial progress, two countries made moderate progress and six countries showed limited or no progress. It is worth noting that among the latter, one country is positioned at a high implementation level, one is at the medium-high level, two at the medium-low and two at the low implementation level. **Given the large spectrum covered by the 11 elements of this dimension at national and other levels, the way forward will require that each country identifies specific areas that need to be strengthened.**
3. Several countries showed limited or no progress in their level of implementation between 2017 and 2020 for important IWRM elements, such as the private sector and public participation. **Moving forward, a point of vigilance to be considered by countries is the need to progress on elements that require to be strengthened but at the same time maintain the progress already achieved.**
4. Although the Arab region made substantial progress between 2017 and 2020 on cross-sectoral coordination (score increased from 58 to 70), this element is still a key challenge for most countries, as it is at the very heart of IWRM. Cross-sectoral coordination for effective IWRM implementation to meet the water demands of various

sectors and environmental uses in the region can be a source of tension between the different sectors. It should be noted that the high score may not always be reflected in day-to-day implementation in the region with cross-sectoral coordination hinging on personal relations in many cases. Furthermore, many countries still report that cross-sectoral coordination remains a significant and ongoing challenge to implement in practice. **Moving forward, Arab countries should take additional steps to put in place and institutionalize formal mechanisms and agreements for coordination involving several sectors such as agriculture, industry, energy, health, finance and environment.**

5. The lowest performance in the institutions and participation dimension is the participation of vulnerable groups (medium-low, 36). **Country recommendations include: (1) enhance the understanding of authorities about the importance to identify and consider vulnerable groups relevant to the water sector and about the best means to involve them in planning; (2) put in place policies and legal frameworks that facilitate the effective participation of vulnerable groups in water resources planning and management; (3) provide special funding for such engagement.**

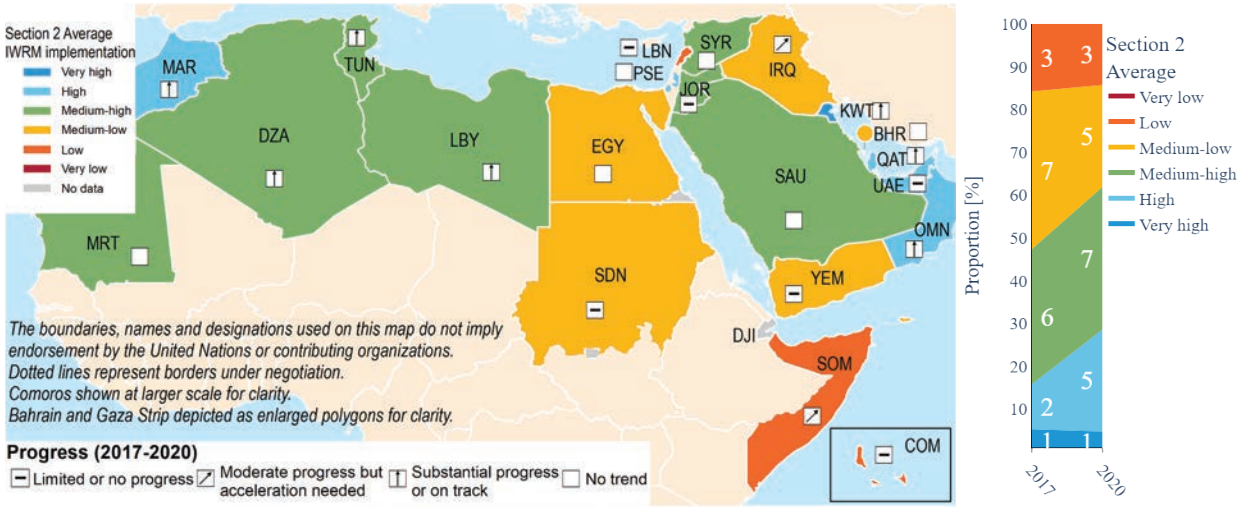
While each of the four dimensions is important for advancing IWRM implementation, the link between dimension 1 (enabling environment) and dimension 2 (institutions and participation) is very close. When IWRM laws, policies and plans are established, their implementation requires institutions with clear mandates and sufficient capacity and resources. On the contrary, when countries are not in a position to provide the appropriate enabling environment, institutions and stakeholders will struggle to effectively support the implementation of IWRM. Therefore, institutions and stakeholder participation across sectors are needed at national and local levels to implement plans and enforce regulations for IWRM implementation. The different stakeholders (for example, government agencies, water user associations, local communities and the private sector)[41] should play an important role in moving forward IWRM implementation by contributing to decision-making regarding water allocation or serving as watchdogs regarding water accessibility, availability and quality.

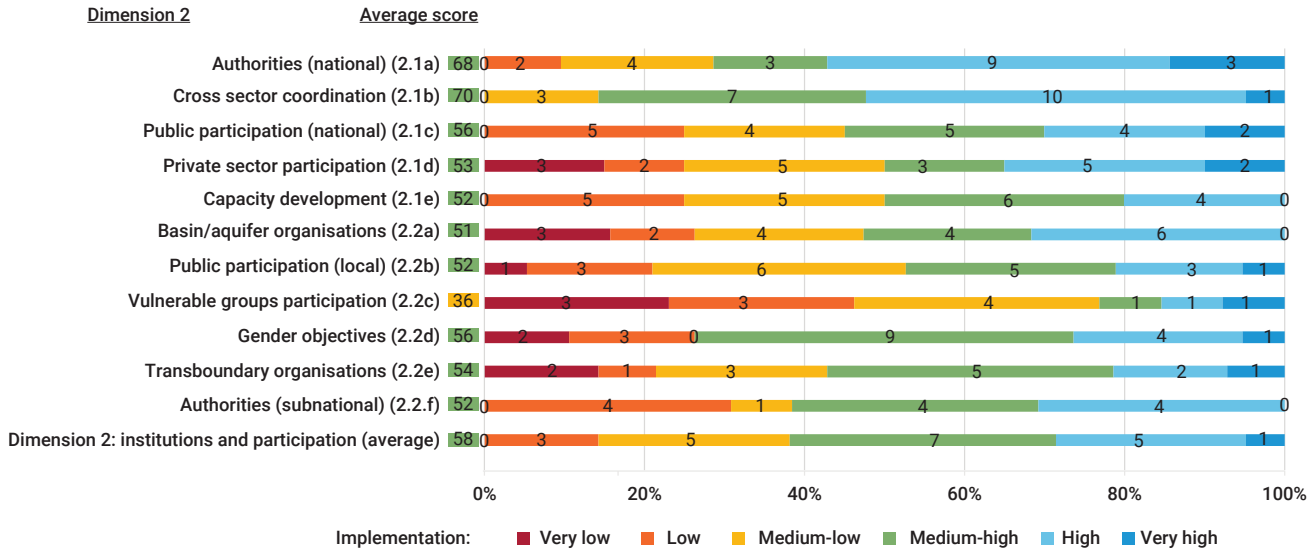
The Arab region's overall performance in establishing institutions and engaging stakeholders for IWRM implementation is in medium-high with a score of 58, very close to the region's score for enabling environment (56) (figure 3.4).

In general, countries in the Arab region made good progress between 2017 and 2020 in strengthening IWRM institutions and participation with the average implementation of this dimension increasing from 51 to 58. As shown in figure 3.4, out of the 15 countries that reported in both 2017 and 2020, seven made substantial progress, two made moderate progress and six showed limited or no progress. It is worth noting that among the latter, the United Arab Emirates is positioned at a high implementation level and Jordan is at a medium-high implementation level. Given the large spectrum covered by the 11 elements of this dimension at the national level as well as other levels, the way forward will require that each country identifies specific areas that need to be strengthened. Moving forward, a point of vigilance to be considered by countries is the need to progress on elements that require to be strengthened but at the same time maintain the progress already achieved.

62 per cent of the Arab countries (13 out of 21) have the capacity to adequately implement IWRM elements related to establishing institutions and engaging stakeholders under long-term programmes (on average, medium-high implementation).

Figure 3.4 Implementation status, per country, of institutions and stakeholders' participation and progress made between 2017 and 2020





When looking at the average implementation of each of the elements for this dimension, it appears that cross-sectoral coordination has the highest score (70) at the threshold between medium-high and high level of implementation. Given the importance of cross-sectoral coordination for effective IWRM implementation in the water-scarce Arab region, where water demands for domestic, agriculture, industry, services and environmental uses can be a source of tension between the different sectors, it is encouraging to see that the implementation of this element has improved from a score of 58 in 2017 to 70 in 2020. In addition, 18 countries (86 per cent) have demonstrated their ability to prioritize and strengthen coordination with other water-related sectors (at least medium-high implementation level). Eleven of these may have put in place formal mechanisms and agreements for coordination involving several sectors such as agriculture, industry, energy, health and environment. This trend should be followed by more countries in the region.

However, it should be noted that this score may not always be reflected in day-to-day implementation in the Arab region with cross-sectoral coordination hinging, in many cases, on personal relations or on champions that handle this coordination. Furthermore, many countries still report that cross-sectoral coordination remains a significant and ongoing challenge to implement in practice. Recognizing the need for cross-sectoral coordination for IWRM implementation, Morocco engaged in a very ambitious plan for drinking and irrigation water supply with a cost of $11.54 billion for the period 2020-2027 (box 3.3).

The increasing awareness in Arab countries of the importance of cross-sectoral coordination is also highlighted in the involvement of several stakeholder groups in the consultation processes of SDG indicator 6.5.1 national reporting exercise (section 1.4 and annex 1).

Several initiatives were undertaken at the regional level to address the issue of cross-sectoral coordination, in particular between water and agriculture sectors, which use most of the available water in the region. In April 2019, ESCWA and the Food and Agriculture Organization of the United Nations (FAO) supported the organization of the First Joint Meeting of Arab Ministers of Agriculture and Water, which took place at the League of Arab States in Cairo. The meeting resulted in a call for the effective integration of water and food security issues into the national sustainable development strategies and the adoption of the 2019 Cairo Declaration urging governments and partners to reinforce regional coordination and harmonize policies across both sectors to face the impacts of climate change and water scarcity.

The first meeting of the Joint High-Level Committee on Agriculture and Water took place on the sidelines of the 2019 Cairo Water Week. A background paper was prepared by the technical committee comprised of ESCWA, FAO, the Arab Organization for Agricultural Development and the AMWC on "Water allocation for agriculture in the Arab region: Towards a paradigm change". The paper provided a number of recommendations that focused on needed changes in water and agricultural strategies to make water allocation mechanisms more sustainable with a view to coping with increasing water scarcity in the region. The meeting also resulted in the adoption of five suggested priority areas for the work of the Joint High-level Committee on Agriculture and Water, namely (1) water allocation in agriculture, (2) water productivity, (3) efficient water use, (4) use of non-traditional water in agriculture, (5) water-food-energy nexus.

The second meeting of the Joint High-Level Committee on Agriculture and Water took place virtually during the 2020 Cairo Water Week and was jointly organized by ESCWA, FAO and the League of Arab States. It discussed the progress made in the implementation of recommendations reached at the first technical meeting and the proposed action plan for the implementation of the 2019 Cairo Declaration. After the action plan was reviewed by the member countries, an expert group meeting, jointly organized by ESCWA, FAO and the League of Arab States, took place virtually on 27 January 2021. It discussed, revised and finalized the action plan for the implementation of the 2019 Cairo Declaration for

presentation at the Second Joint Meeting of Arab Ministers of Agriculture and Water taking place in October 2021.

In addition, the technical committee is preparing Voluntary Guidelines for Improved Water Allocation for Agriculture that is intended to provide Arab decision-makers and water resource planners with relevant approaches and guiding principles to assist in the development, design, implementation and enforcement of water allocation regimes for the sustainable use of water resources. These guidelines are to be reviewed at an expert group meeting taking place in September 2021 before their submission for discussion by the Joint High-Level Committee and adoption during the Second Joint Ministerial Meeting for Agriculture and Water.

The lowest performance in the institutions and participation dimension is recorded for the participation of vulnerable groups, which stands at a medium-low level of implementation (36). This aspect is newly introduced in the 2020 survey on SDG 6.5.1. It appears that there is a need for a better understanding of the definition of "vulnerable groups"[42] as some Arab countries limited their reporting for this aspect to gender issues. This aspect is particularly important in the Arab region, where vulnerable communities are found within groups of refugees and internally displaced persons estimated at around 26 million.[43]

In the eight countries with very low to medium-low scores, the participation of vulnerable groups is not explicitly addressed in laws, policies and plans. For example, in 2020, Lebanon amended the water law No. 77 of 2018 without specifically mentioning the vulnerable groups. Several improvements are identified for the way forward, namely (1) enhancing the understanding of authorities about the importance to identify and consider vulnerable groups relevant to the water sector and about the best means to involve them in decision-making, (2) putting in place policies and legal frameworks that facilitate the effective participation of vulnerable groups in water resources planning and management and (3) providing special funding for such engagement. Even in countries where vulnerable groups are included in plans and policies, more resources are needed for effective implementation. The way forward also implies considering specific procedures for the vulnerable.

While the Arab region has, on average, adequate capacity to implement the dimension on institutions and participation, wide disparities exist between Arab sub-regions, with the highest average score recorded for the GCC (78) and the lowest for the Southern sub-region (32) (table 3.2). It is highly recommended to strengthen cooperation between sub-regions to disseminate good practice and share experiences for establishing institutions and increasing participation for IWRM implementation. This must be coupled at the national level with increased political will and commitment to establishing and empowering institutions with clear mandates along with clear mechanisms for empowering and engaging relevant stakeholders in all stages of IWRM planning and implementation.

Box 3.3 Morocco's National Program for Drinking and Irrigation Water Supply 2020-2027

In Morocco, the framework agreement, which defines the conditions of financing and implementing the National Program for Drinking and Irrigation Water Supply, 2020-2027, was signed in January 2020 to fight the effects of climate change on already scarce water resources and guarantee water security. This integrated Program with a budget of around $11.54 billion is aimed at improving water supply, particularly by building dams ($6.1 billion), managing demand and developing water mainly in the agricultural sector ($2.51 billion), strengthening drinking water supply in rural areas ($2.69 billion), reusing treated wastewater in the irrigation of green areas ($230 million), and boosting communication and awareness concerning the importance of preserving water resources and rationalizing their use ($5 million). The implementation of the Program involves close cross-sectoral coordination that is formalized in the agreement signed by the Ministry of Equipment, Transport, Logistics and Water, the Ministry of Energy, Mines and Environment, the Ministry of Interior, the Ministry of Agriculture, Maritime Fisheries, Rural Development, Water and Forests, the Ministry of Economy, Finance and Reform of the Administration, and the National Office of Electricity and Drinking Water.

Source: Naji Abderrahman, "The Morocco water saving program", ***Wall Street International Magazine***, 17 July 2020.

Table 3.2 Scores of the four Arab sub-regions in the eleven elements of institutions and stakeholder participation (with the lowest and highest values between parentheses)

2. Institutions and participation	GCC	Maghreb	Mashreq	Southern	Arab region
2.1 National level					
(a) National institutions	88	76	62	35	**68 (20-100)**
(b) Cross-sectoral coordination	85	68	70	50	**70 (40-100)**
(c) Public participation	68	68	50	35	**56 (20-100)**
(d) Business participation	72	62	40	35	**53 (0-100)**
(e) Capacity development	66	50	55	30	**52 (20-80)**
2.1 Average	**79**	**65**	**55**	**37**	**61 (28-100)**
2.2 Other levels					
(a) Basin/aquifer organizations	78	54	45	30	**51 (0-90)**
(b) Public participation	73	58	48	33	**53 (10-100)**
(c) Participation of vulnerable groups	80	67	30	10	**36 (0-100)**
(d) Gender objectives	80	56	53	38	**56 (10-100)**
(e) Transboundary organizations	70	70	50	15	**54 (0-100)**
(f) Subnational authorities	80	60	56	20	**52 (20-80)**
2.2 Average	**77**	**59**	**47**	**27**	**53 (12-90)**
Dimension 2 average	**78**	**63**	**51**	**32**	**58 (19-100)**

Some countries reported on the need to strengthen the relevant institutions with human and financial resources so that they can carry out their roles effectively. It is also important to establish information and training centres to carry out training and capacity building for the different stakeholders of the water sector, including on IWRM, and to develop programmes involving the different ministries on the interconnection between energy, water and food.

3.3 Applying management instruments

Key findings and recommendations

1. The score of the Arab region for the development and implementation of IWRM management instruments (54) is very close to the world average (55), with all the elements in the upper level of medium-low or medium-high levels (46 to 65). **This is encouraging and partly represents the regional priorities laid out in the ASWS, but the region should increase efforts in all categories, with particular attention to operational water management instruments related to using their ecosystems, monitoring their basins and aquifers and sharing data on transboundary waters. Countries should also invest in effective data and information sharing systems both at the national and regional levels to monitor the resources availability, use and quality.**

2. The GCC sub-region scores high (75), while the Southern sub-region is far behind the other sub-regions for this dimension (27). **Therefore, fundamental targeted country-level efforts should be made to accelerate and strengthen IWRM operationalization. These efforts should be complemented by greater coordination and experience sharing with Arab countries that have good IWRM implementation, within the framework of the regional organizations and the League of Arab States.**

3. From 2017 to 2020, four countries made substantial progress, three showed moderate progress, while eight had limited or no progress. **The overall trend may be positive, but it should not mask the realities of several countries that need to work on improving their implementation rates. Furthermore, the IWRM implementation of basin and aquifer management instruments need to be accelerated to meet the 2030 objectives.**

The performance in management instruments dimension is measured through nine elements that provide a framework for implementing IWRM, namely (1) at the national level: (a) water availability monitoring, (b) sustainable and efficient water-use management, (c) water pollution control, (d) water-related ecosystems management, (e) management of water-related risks of disaster; (2) at other levels: (a) basin management, (b) aquifer management, (c) data- and information-sharing within countries, (d) transboundary data and information sharing. Success in this dimension requires provision of data and information, in conjunction with many other elements including specific laws, policies, and institutional arrangements to all relevant stakeholders to allow for informed decision-making.

The implementation of water management instruments in the Arab region scores very close to the world average at the high-medium level (54). All the elements are in the upper level of medium-low to medium-high implementation categories (46 to 65). Countries show variations in the implementation of management instruments (figure 3.5). 57 per cent of the Arab countries are performing at a medium-high implementation level and above, with six countries in the high level (Jordan, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates). On the other hand, Lebanon and Somalia may have just started the implementation of this dimension (low level) while the Comoros may have not even started the work (very low level).

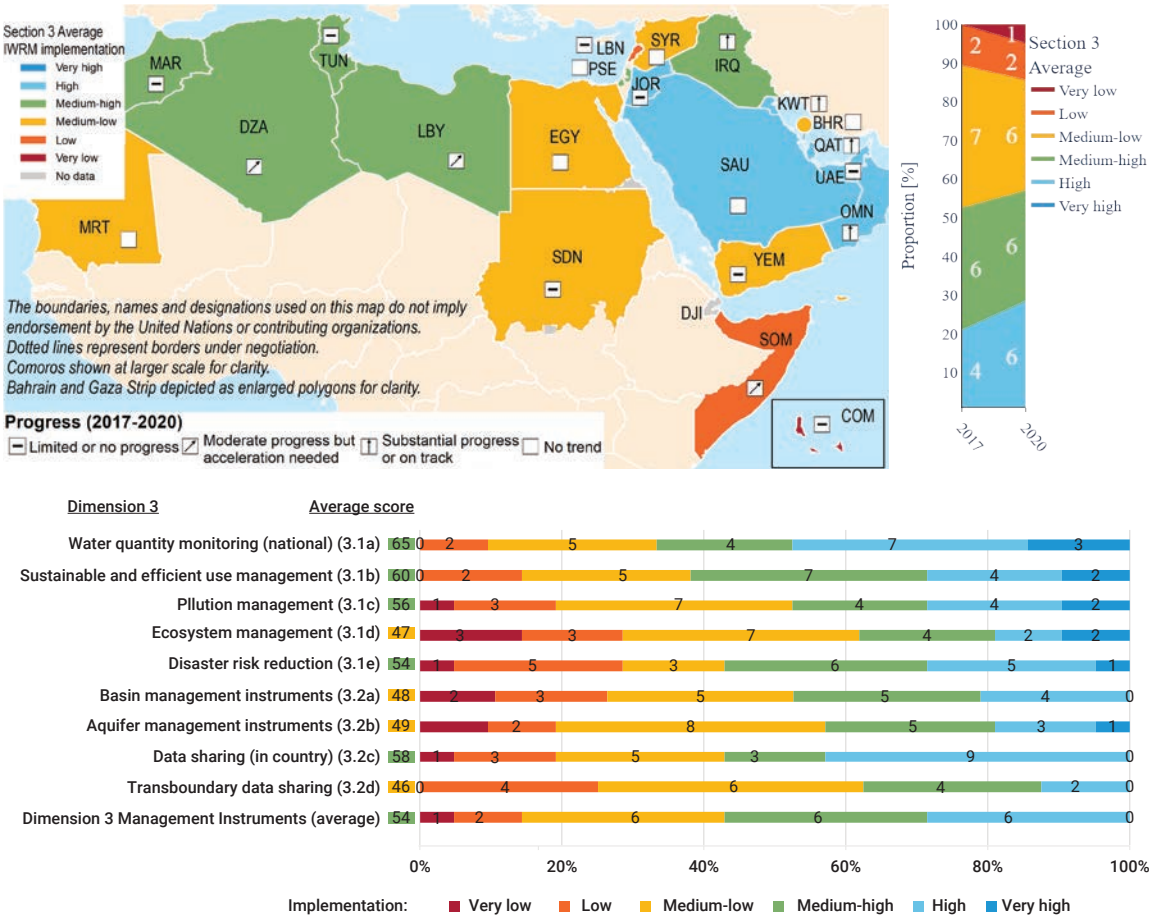
The analysis of the 2017-2020 progress results indicates that, out of the 15 countries that reported in both 2017 and 2020, four made substantial progress and seem to be on track for achieving the 2030 objectives, three showed moderate progress and need to accelerate their level of IWRM implementation, while eight have limited or no progress (figure 3.5). On average and in general, the trend is positive for this dimension, but this should not mask the realities of several countries that need to work on improving their implementation rates. Besides, the IWRM implementation of basin and aquifer management instruments need to be accelerated to meet the 2030 objectives.

In twelve Arab countries, water resources management instruments are generally adequate and some elements are largely being implemented (on average, medium-high implementation and above).

The highest average scores are obtained for national availability monitoring (65) and sustainable and efficient water-use management (60) (figure 3.5). However, there is a pressing need to improve these elements considering the high levels of water stress experienced by many Arab countries. 14 countries are at least in medium-high for each of these two elements (national availability monitoring and sustainable and efficient use management), which indicates that long-term national monitoring and efficient management are carried out with adequate coverage. Most of the countries reported that, at the national level, responsibilities for monitoring (quantity and quality) and mobilizing water resources were well defined and that implementation was satisfactory. However, there is a need to upgrade the infrastructural support, strengthen capacity building of the staff and enforce regulations regarding abuses and water pollution.

These elements are part of the regional priorities laid out in the ASWS (2010-2030),[44] as well as at the AFSD[45] and the HLPF in 2021.[46] The SDG 6 GAF also identifies data and information as one of the five accelerators to achieve SDG 6.

Figure 3.5 IWRM implementation status, per country, of water resources management instruments and percentage of countries per implementation, 2017 vs 2020



The development and implementation of ecosystem-, basin- and aquifer-management as well as transboundary data sharing instruments score the lowest of all nine elements (46-49). The three first elements are very important for surface and groundwater development in the Arab region, which suffers scarcity of water resources and witnesses an increasing water demand for agriculture and other human activities. The issues of transboundary water resources need to be addressed in a timely manner. The information and data about this important element need improvement in addition to the enabling arrangements and frameworks mentioned in section 3.1 of this report. It is worth noting that there is a discrepancy between the score values for the three elements and what the countries reported. In fact, most of the countries indicate that appropriate management tools are being implemented in the country. For example, Iraq scored 80 (medium-high) and mentioned that there was no complete coverage for monitoring groundwater reservoirs, especially in remote areas. Jordan scored 90 (high) and reported that the Ministry was in the process of developing a comprehensive monitoring system for the different water policies. Several countries have reported establishing national web-based information management systems on water resources. In some cases, there is a need to offer more training to the technical staff.

An analysis of the sub-regions reveals that the GCC sub-region reports the highest average implementation of management instruments (75 – high level) (table 3.3). The Maghreb is behind on eight elements out of nine, with an average score of 55, while the Mashreq scores lower on all the elements compared to the GCC. The Southern sub-region lags significantly behind, with an average score of 27. These scores are in conformity with the pattern for each HDI group, meaning that the advancement of management instruments should be included with the other development programmes of countries.

Box 3.4. Sustainable and efficient water use management at the national level in Oman

The Omani National Water Resources Plan 2000-2020 aimed to lay a sound basis for the development and management of water resources in the Sultanate. The plan made the necessary arrangements to provide the required additional quantities of water through an integrated programme implemented in phases with focus on the following elements: (1) establishing underground recharge and surface storage dams; (2) increasing investments in the provision of non-conventional water; (3) treating and using water associated with oil production; (4) collecting fog water and artificial rain; (5) storing treated water in underground reservoirs to avoid sea water intrusion; (6) using modern irrigation methods and less water-relying crops; (7) organizing and controlling water withdrawal in farms irrigated with wells by installing water meters (saving 160 million cubic meters per year, about 20 per cent of the Sultanate consumption); (8) reducing the depletion of water; (9) recycling triple-treated sewage water to irrigate parks, playgrounds, etc.; (10) applying policies against the creation of new agricultural lands in areas that suffer water deficit. The elements of the plan, which is prepared for the Ministry of Resources, are implemented, in terms of measures and procedures, through successive five-year development plans involving all stakeholders and water users, such as the Ministry of Agriculture and Fisheries, the Ministry of Environment and Climate Affairs, the Public Authority for Water, civil society and water associations. The role of other relevant government agencies and the private sector is taken into consideration in achieving the desired goals.

Table 3.3 Scores for the implementation of management instruments in the four Arab sub-regions (with the lowest and highest values between parentheses)

3. Management instruments	GCC	Maghreb	Mashreq	Southern	**Arab region**
3.1 National level					
(a) Water availability monitoring	88	64	62	35	65 (20-100)
(b) Sustainable water-use management	78	54	55	45	60 (20-100)
(c) Pollution control	82	56	55	18	56 (0-100)
(d) Ecosystem management	80	48	37	13	47 (0-100)
(e) Disaster risk reduction	77	48	60	18	54 (0-100)
3.1 Average	**81**	**54**	**54**	**26**	**56 (12-100)**
3.2 Other levels					
(a) Basin management instruments	73	52	43	28	48 (0-80)
(b) Aquifer management instruments	72	52	38	25	49 (0-100)
(c) In-country data sharing	70	54	63	35	58 (0-90)
(d) Transboundary data sharing	43	65	40	30	46 (20-80)
3.2 Average	**66**	**56**	**46**	**29**	**51 (7-83)**
Dimension 3 average	**75**	**55**	**50**	**27**	**54 (10-90)**
HDI	0.844	0.689	0.688	0.515	0.700 (0.470-0.890)

Apart from the Southern countries, the Arab region is doing quite well on four elements of the management instruments. Most countries in the three sub-regions perform well on in-country water availability monitoring, sustainable water-use management, pollution control and data- and information-sharing.

It is promising to see that several countries in the region report about implementing some pollution-management instruments, with five of them in the GCC sub-region, on a long-term basis with very good coverage across sectors and the country. Four countries report very limited or no implementation of the pollution management instruments. These will have to address this very important element, which affects all water sources and hinders the sustainability aspect of the resource.

3.4 Financing water resources management and development

Key findings and recommendations

1. In the Arab region, financing IWRM implementation has the lowest average score (46, medium-low) of the four IWRM dimensions, indicating that this dimension is not given the appropriate attention, even though the success of IWRM development and management is tightly linked to budgeting and financing. Countries are doing better at the national level (medium-high, 53) compared to the other levels – subnational budget for infrastructure, revenue raised, transboundary, subnational or basin budgets – (37, medium-low). **As such, most Arab countries need to improve the financing of IWRM implementation with particular attention to the subnational/basin levels. Financing is a priority identified at the regional level by the ASWS and at the global level as one of the accelerators of the SDG 6 GAF. Countries should benefit from the focus availed through these regional and global agendas to access increased financing that facilitates implementation of country IWRM plans.**

2. Funding of IWRM implementation is insufficient in 12 Arab countries out of 21 at the national level and in 13 countries at subnational level. **Therefore, most Arab countries need to significantly increase financing for water resources development and management both at national and subnational/basin levels.**

3. Only few countries have sufficient funding for the water management and infrastructure required to achieve the SDGs. Most Arab countries reported that revenues were affected by the lack of recovery of water-use fees and were consequently not enough to cover the needs of the water sector. **Most Arab countries need to address the issue of revenue raising for IWRM implementation while ensuring affordable access to water.**

4. On average, the GCC and Maghreb sub-regions are implementing the IWRM financing dimension at higher levels than the Mashreq and Southern sub-regions. **Some experience-sharing initiatives on funding mechanisms and more financial support should be given to the Mashreq and Southern sub-regions to accelerate IWRM financing implementation in the Arab region. Urgent financial support should be availed to the Southern sub-region (low level) to accelerate implementation.**

5. In general, the Arab region has made an average progress in implementing IWRM financing between 2017 and 2020 on average, with substantial progress in five countries, moderate progress in three and limited or no progress in seven countries. **This result should not hide the fact that several countries need to work on improving their implementation rates, particularly the seven countries with limited or no progress.**

Effective water governance depends on coherent financing mechanisms. It is also important to identify the financing needs, sources and the allocation of financial resources. Effective and efficient financial arrangements are required to ensure effective IWRM implementation as finance and good water governance are inextricably linked.[47] Only few countries have sufficient funding for the water infrastructure required to achieve the SDGs. Therefore, public funds need to be combined with other financing sources, including private investment.[48] According to the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) report, the current level of WASH financing is not sufficient to meet SDG targets and there is a need for a radical increase in investments in the sector.[49] In order to achieve the SDG related to drinking water alone, an additional investment of about $1.7 trillion is needed globally until 2030, which is about three times the current investment levels.[50] In addition, projections of global financing needs for the water infrastructure range from $6.7 trillion by 2030 to $22.6 trillion by 2050.[51] The three major sources of funds for water and sanitation are taxes from individuals and businesses; transfers such as overseas aid, remittances or market interest rate lending; and tariffs paid by households, businesses and governments.[52] Furthermore, financing was identified at the global level as one of the accelerators of the SDG 6 GAF that allows countries to implement their IWRM plans.

The financing dimension of IWRM implementation reflects the extent to which the financial resources available for water resource development and management are

appropriate or sufficient. The fifth performance indicator of the ASWS (2010-2030) is to "increase the amount of funding available for the water sector and build an Arab industrial and technological base in this field", with focus on increasing investments in the water sector, private sector contribution in financing and management of water projects, and volume of production and usage of Arab-made products in all water-related fields.

Financing aspects are captured through questions on national and subnational investment and recurrent cost budgets for infrastructure (Q.4.1a and 4.2a) and for IWRM elements (Q.4.1b and 4.2d) as well as revenue raised for IWRM elements (Q.4.2b) and financing transboundary cooperation (Q.4.2c) (figure 3.6).

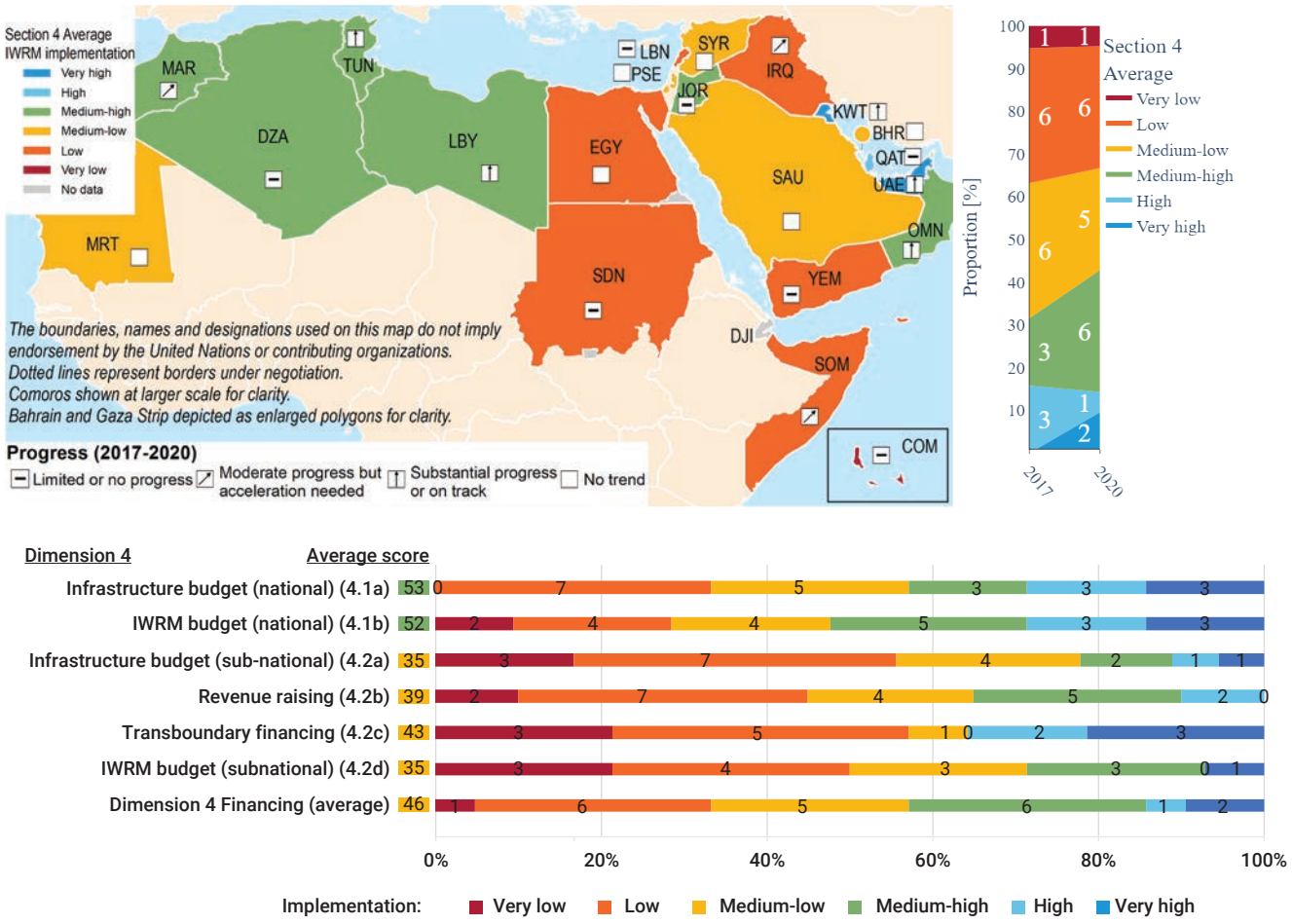
Out of the 15 countries considered by the progress of IWRM financing implementation between 2017 and 2020, five countries made substantial progress and seem to be on track for achieving the 2030 objectives, three countries showed moderate progress and need to accelerate their level of IWRM financing implementation, while seven countries have limited or no progress (figure 3.6). On average and in general, the Arab region made an average progress in implementing IWRM financing between 2017 and 2020 even though the trend was positive for most of the four elements of the dimension. This result should not hide the fact that several countries need to work on improving their implementation rates.

Only 9 countries (43 per cent) are satisfactorily implementing IWRM elements of financing water resources management (on average, medium-high level and above).

In the Arab region, financing for water resource management has the lowest average score (46) of the four IWRM dimensions. This score in the medium-low level is similar to the world's average indicating that this dimension is not given the appropriate attention worldwide although the success of IWRM implementation is tightly linked to the budgeting and financing made available for IWRM development and management. The Arab countries are doing better for the IWRM financing at the national level (medium-high, 53) compared to the subnational level (medium-low, 37). The dimension average should not hide this aspect and the fact that seven countries score low and very low on several elements of this important dimension.

On the other hand, the countries that are fully or generally implementing this dimension belong to the GCC sub-region and have very high HDI scores and a high gross domestic product. Qatar, for example, provides sufficient budget for the planned infrastructure investments and projects are

Figure 3.6 IWRM implementation status, per country, of financing and percentage of countries per implementation, 2017 vs 2020



implemented by the concerned authorities of water utilities based on the strategy and the short- and long-term plans. Revenues collected from the fees are limited and not used for IWRM activities because the budgets necessary to cover these are provided by the State, which monitors IWRM activities.

Most of the countries reported that water projects were mainly funded by national and local government budgets except in Somalia, which relies on donor funds, mainly from the African Development Bank, the World Bank and the United Nations Development Programme (UNDP), because there is no national budget allocated to water infrastructure from the government. Only very few countries mention the diversification of financial resources for national infrastructure and IWRM element implementation.

The national water policy in Morocco, for example, is based on three levers, namely consolidating public subsidies, strengthening pricing and cost recovery systems, and promoting public-private partnership through appropriate incentives.

In Oman, the water sector budget is allocated through five-year development plans at the level of all governorates. The projects implemented include aquifer recharge dams, protection of dams and surface storage dams, water drilling and pumping, operation and maintenance of dams, hydrometric monitoring networks and maintenance of water installations. Some of the budget is used for research, studies, capacity building and skills development. The budget spent is reviewed annually, the projects are evaluated, and any deficiencies or challenges are addressed. The IWRM implementation is still facing some challenges like insufficient funds to implement the proposed projects in line with future needs, the unavailability of specialized technical personnel and migration of specialized technical expertise in some areas related to water resources management, with the number of dam projects for flood protection increasing due to the Sultanate's exposure to exceptional weather conditions. The fees are collected for drinking water, wastewater, water licenses and environmental licenses. They cover part of the costs of managing water resources, but they are not used directly for IWRM activities.

Algeria reports achieving the Millennium Development Goals set by the United Nations for access to drinking water and sanitation services. This achievement was due to the huge national financial efforts made during the last two decades, particularly in the infrastructure sub-segment with 4.335 billion dinars (about $40 billion). The National Water Fund, managed by the Ministry of Water Resources, relies on revenues from services to different sectors (industry, tourism, etc.), public and territorial institutions in charge of drinking and industrial water supply, and donations and bequests. The other IWRM financial mechanisms include the enactment of the "polluter-pays" and the "withdrawer-pays" principles. The expansion of the "water pays for water" principle is under way for other uses, such as agriculture and animal husbandry. Part of the collected revenues cover the activities related to IWRM, through the National Water Fund.

At the sub-regional level, the GCC scores high on average, the Maghreb medium-high, and both the Mashreq and the Southern countries have medium-low implementation of IWRM financing (table 3.4).

On average, the GCC countries mobilize public financial means for IWRM implementation at a level that is 25 points higher than the Arab and world's average due to high income generation from oil production. However, a close look at individual countries reveals two sub-groups with distinct performances. On one hand, Qatar (85), Kuwait (100) and the United Arab Emirates (93) perform at very high to high overall levels and report that funding is available and all planned projects are under implementation or completed both at national and subnational levels, except for revenue raising. On the other hand, Oman (60) and Saudi Arabia (46) have adequate IWRM financing capacity, at national and subnational levels (medium-high). In Bahrain (40), sufficient budget is allocated for planned investments but is not efficiently disbursed or made available (medium-low).

It is worth noting that the reported level of revenue raised to cover IWRM activities in this sub-region (44) is lower than all the other elements of the financing dimension.

Table 3.4 Scores for the implementation of IWRM financing in the four Arab sub-regions (with the lowest and highest values between parentheses)

4. Financing	GCC	Maghreb	Mashreq	Southern	Arab region
4.1 National level					
(a) Budget for infrastructure	78	58	42	25	53 (20-100)
(b) Budget for IWRM elements	82	56	42	20	52 (0-100)
4.1 Average	**80**	**57**	**42**	**23**	**53 (10-100)**
4.2 Other levels					
(a) Subnational budget for infrastructure	77	44	23	10	35 (0-100)
(b) Revenue raised for IWRM elements	44	54	40	10	39 (0-80)
(c) Transboundary financing	60	90	13	13	40 (0-100)
(d) Subnational or basin budgets for IWRM	100	48	32	10	35 (0-100)
4.2 Average	**49**	**58**	**27**	**11**	**37 (0-90)**
Dimension 4 average	**71**	**57**	**32**	**15**	**46 (7-100)**

It would be of interest to further document the financial levies put in place in the GCC countries. Oman reports that fees collected for drinking water, wastewater, water licenses and environmental licenses cover part of the costs of water resource management but are not used directly for IWRM activities. The limited revenue collected from fees in Qatar is not used for IWRM activities as the government is monitoring the budgets necessary to cover IWRM activities. In Saudi Arabia, some of the limited revenue that is collected from the fees cover the costs of some IWRM activities. The revenue from desalinated water supply services and reuse of treated wastewater in urban areas is collected in the United Arab Emirates. However, this needs to be enhanced and expanded to cover the agricultural sector.

The capacity of the Maghreb countries to mobilize financial resources for IWRM implementation is adequate. Examples from Algeria and Morocco are given in the country analysis above. Tunisia reports that financial resources meet the needs of IWRM elements, mainly through grants from technical assistance. However, there are delays in disbursements for some infrastructure projects. The revenues for IWRM from the collection of fees remain low. A twinning project with the European Union, the Water Code, currently under review, and the strengthening of the Water Police prerogatives aim to improve royalty collection. As for transboundary water resources, Tunisia contributes 30,000 euros annually for the North-Western Sahara Aquifer System consultation mechanism. In general, budget allocations are conducted more nationally than at the subnational level, taking into account IWRM.

Libya reports that the budget allocated to planned infrastructure projects, both at national and subnational levels, is delayed and the implementation of IWRM elements is facing some routine administrative obstacles due to the emergency conditions in the country. The revenues, which are insufficient for the sector needs, are affected by the lacking recovery of water use fees. In Mauritania, the funds allocated to IWRM, which do not stand out with their own budget, remain insufficient.

Lebanon with the lowest score (13) in the Mashreq sub-region gave a thorough description of its situation, which is summarized in box 3.5. Only Somalia, from the Southern sub-region, described the situation regarding the different elements of the IWRM financing. The country relies on donor funds because there is no national budget allocated to water infrastructure from the government and the revenue collection system is inexistent. In addition, all policies, laws, strategies and systems are at an early stage of development. The national transboundary committee of Somalia was established but no discussions are undertaken with riparian countries.

Further information and recommendations on financing are provided in section 5.4.

Box 3.5 Status of financing for water resources development and management in Lebanon

The National Water Sector Strategy (2010-2020) contained an investment plan. About 66 per cent of the total ongoing and planned investments in the 2001-2015 period were financed by foreign funds compared to 34 per cent of investments, which were locally financed. Most of the targets contained in the strategy have not been achieved so far and the prospects for the future are not optimistic given the economic crisis in Lebanon. In order to ensure sustainable water management, the water law No. 77 of 2018 allowed the Ministry of Energy and Water to conclude contracts with public or private entities in compliance with the provisions of the general and local water master plans. These should also define the financial contributions of various partners. Currently, drinking water tariffs do not allow the recovery of costs, except in Beirut and Mount Lebanon, due to the symbolic flat fee which was applied on all water customers since 2011. However, the National Water Sector Strategy (2010-2020) aims to introduce volumetric tariffs in the pilot areas of fully metered connections. Since limited budgets are allocated for transboundary cooperation, Lebanon is currently exploring the possibility of joining the 1992 Water Convention of the United Nations Economic Commission for Europe (UNECE), which might help in raising funds for transboundary collaboration. The implementation of the water law No. 77 of 2018, once its application decrees are finalized, should persuade the Government to allocate funding from the national budget for IWRM elements.

4

Supporting Arab regional priorities

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Key findings and recommendations

1. The AMWC accounted for the importance of groundwater and included cooperation mechanisms and frameworks for the management of shared water resources among the six expected outcomes of the ASWS (2010-2030) in the Arab region. **Hence, the implementation of IWRM to these water resources needs to be considered as an Arab regional priority.**
2. The average implementation scores of groundwater and transboundary water resources, across the four IWRM dimensions, are both at the medium-low level, (49) and (47) respectively. **Therefore, it is very important for Arab countries to pay increased attention to these very important water resources.**
3. The score of Arab countries is, on average, at the medium-low level for groundwater resources (49). Most of the aquifers are overexploited due to increasing demand and declining availability of surface water. Given that most of the countries in the region depend on this resource, **it is important and urgent to pay special attention for its protection and sustainable management.**
4. The average score for transboundary water resources, across the four dimensions, is at the medium-low level. Since about two thirds of all freshwater resources cross one or more country borders in the Arab region and most Arab countries depend on them, **more intra- and inter-regional cooperation arrangements or agreements are needed for the sustainable and efficient exploitation of these resources.**

4.1 Summary of Arab regional priorities

Groundwater in the Arab region contributes more than 50 per cent of total water withdrawals in Arab countries. With at least 42 shared aquifers in 21 countries, the number of shared aquifers exceeds that of shared surface water basins.[53,54] In addition, 14 countries share a surface water basin with one or more riparian States. While there are 27 transboundary surface water basins in the region, there is only a limited number of operational agreements for water cooperation.[55] The dependency of the region on external water sources is amplified by the fact that around 60 per cent of its water resources originates outside its borders.[56] Henceforth, groundwater and transboundary water sources are key for a sustainable socio-economic development, climate resilience and peace keeping. This chapter focuses on the integrated management of groundwater (section 4.1) and transboundary water resources (section 4.2), at the national level and through transboundary cooperation. The IWRM implementation to these two important water resources was reported and discussed in the 2019 Arab regional report on SDG indicator 6.5.1.[57]

Groundwater resources are overexploited in most Arab countries even in surface water-rich countries due to increasing demand and declining availability of surface water. Their overexploitation further exposes them to pollution from agriculture, industry and other human activities. Several studies have been devoted to the major groundwater systems in the region.[58,59,60]

Arab countries need to improve transboundary water cooperation by availing and sharing knowledge and experience, improving financing and increasing capacity-building initiatives. The absence of cooperation arrangements to organize and manage transboundary water threatens water security in many parts of the region.

Given the importance of groundwater and transboundary water resources, these were discussed during the water preparatory meeting for the 2018 AFSD and the HLPF. They were listed in the outcome document as part of the four priorities, as follows:[61]

1. Strengthening of IWRM to cope with water scarcity by putting more emphasis on water demand management and improving surface and groundwater governance.
2. Enhancing cooperation on shared water resources.
3. Supporting climate change adaptation and reducing disaster risks, which could be linked to groundwater as a major adaptation resource to climate change in the Arab region.
4. Improving water-related infrastructure to ensure water services to all.

In addition, the AMWC included transboundary water among the six expected outcomes of the ASWS (2010-2030) and called for more cooperation mechanisms and frameworks as well as the activation of mutual agreements concerned with the management of shared water resources.[62]

The average implementation scores of the Arab region are at the medium-low level for both groundwater (49) and transboundary (47) water management, across the four IWRM dimensions (table 4.1). As such, it is relevant to address these two important water resources in this report and draw attention to their management.

2017 and 2020, the level of implementation still needs a lot of improvement in order to be on track for the 2030 objectives. Special attention should be given to aquifer management, financing and transboundary data sharing elements that scored the least in terms of the 2017-2020 progress.

Although there has been some substantial to moderate progress on all elements at varying degrees between 2017

and 2020, the level of implementation still needs a lot of improvement in order to be on track for the 2030 objectives. Special attention should be given to aquifer management, financing and transboundary data sharing elements that scored the least in terms of the 2017-2020 progress.

Table 4.1 Average implementation scores across the four IWRM dimensions for aquifer and transboundary water management

Groundwater	Transboundary				
3.2b Management instruments	1.2c Arrangements	2.2e Organizations	3.2d Data sharing	4.2c Financing	**Average**
49	46	54	46	40	47

4.2 Groundwater resources management

Key findings and recommendations

1. There is no clear correlation between the degree of dependence on groundwater resources and the implementation of aquifer management instruments. However, most of the Arab countries (15 out of 18 that reported scores for this element) are implementing at least partially their management instruments. **They need to focus on geographic coverage and stakeholder participation.**
2. Nine countries have established management instruments for their groundwater resources, including four that implement these with very good to excellent coverage and at least adequate ownership and use by stakeholders. **These may share their experience and know-how with other Arab countries.**

Among the different elements pertaining to groundwater, only question 3.2b (aquifer management instruments) is specifically dedicated to this resource. The other questions, which relate to both surface water basins and aquifers together (1.2b basin/aquifer plans, 2.1a basin/aquifer national organizations, 3.1a national water availability monitoring, 3.2c data and information sharing within countries and 4. financing dimension), would likely concern groundwater management arrangements to a good extent for most Arab countries given their high reliance on groundwater. We report here mainly on the aquifer management instruments and extracts from country reports regarding the other elements.

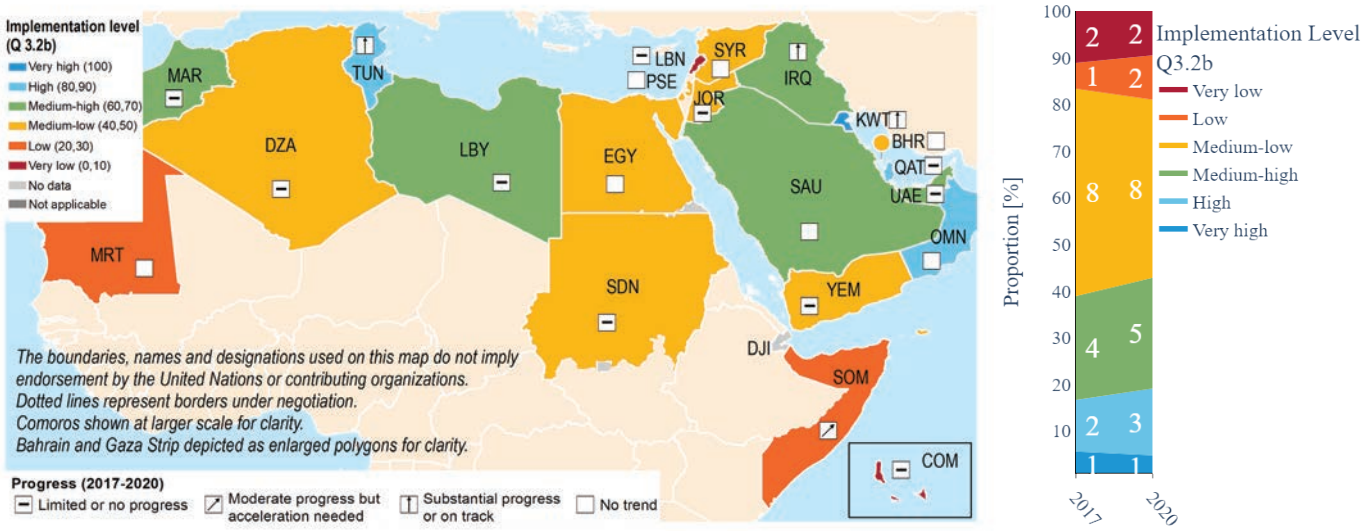
The implementation of aquifer management instruments (Q3.2b) is effective with at least an adequate coverage in nine countries (medium-high implementation and above, figure 4.1). Eight countries have long-term programmes with limited coverage (medium-low implementation). Kuwait (very high level) reported having carried out many hydrogeological studies to exploit the aquifer's potential in the most efficient way employing all the available hydrological, geological, chemical and geotechnical data (box 4.1). Oman (high level) implemented two major projects to establish an inventory of the wells and the Aflaj irrigation systems to account for their number, distribution, quality of water, crops based on them and methods of their exploitation. Their cost amounts to around $190 million.

Nine countries are implementing effective aquifer management instruments with at least an adequate coverage (medium-high implementation and above).

Box 4.1 Groundwater resources management in Kuwait

Kuwait relies on groundwater for its natural water resources with two main aquifers: Kuwait Group and Dammam Formation. The management of this vital resource is the responsibility of the Ministry of Electricity and Water (MEW) in close coordination with the agriculture and environment authorities. Both the quantity and quality of groundwater resources are evaluated by hydrological, geological, geochemical and geophysical methods. Activities in the polluted fresh groundwater are monitored by collecting water samples and analysing them for petroleum contamination, then remediation activities are planned. The groundwater exploration is carried out through exploratory, monitoring and production wells in the two major aquifers. Several water research institutes are involved in water management, including the Kuwait Institute for Scientific Research, the MEW Water resources Centre, the MEW Chemistry Department, the Foundation for the Advancement of Sciences, and Kuwait University. Capacity development and experience sharing are conducted through workshops, using up-to-date scientific and technical approaches. All water resources development projects are approved and evaluated by the MEW and studies are further carried out to enhance these vital resources utilizing mathematical modelling techniques. At present, there is no bilateral or regional agreement for the proper management of transboundary aquifers.

Figure 4.1 Country implementation of aquifer management instruments and progress made between 2017 and 2020



Some countries indicated introducing some new tools for aquifer management, such as aquifer and catchment contracts (Algeria), monitoring and evaluation (Libya), and national hydrological map (the United Arab Emirates). Somalia (low level) and Lebanon (very low level) are implementing management instruments to their aquifers only through short-term and ad hoc projects.

The average level of implementation at the sub-regional level is in conformity with the general trend and the average level of HDI, as follows: GCC: 72; Maghreb: 52; Mashreq: 38; Southern sub-region: 25.

Out of the 14 countries that reported in both 2017 and 2020 (Oman did not score on this element in 2017), three (Iraq, Kuwait and Tunisia) made substantial progress and seem to be on track for achieving the 2030 objectives, Somalia showed moderate progress and need to accelerate its level of IWRM implementation, while the other 10 countries (71 per cent) have limited or no progress. On average, the level of progress in the Arab region is limited and most countries need to work on improving their implementation rates.

A review of the country reports about questions combining surface water basins and aquifers (1.2b plans, 2.1a national organizations, 3.1a national water availability monitoring, 3.2c data and information sharing within countries, and 4. financing dimension) allowed to generate the following information about groundwater resources.

Kuwait reported that its groundwater resources were efficiently exploited. The State of Palestine has a modelling and management plan for its aquifers and the Ministry of Agriculture has a national policy and strategy for the agricultural systems. Oman indicated that management plans for the most important water basins were being monitored by numerical modelling programmes to calculate the capabilities of underground reservoirs, safe withdrawal rates and recharge rates, and to determine the various future scenarios. Algeria reported having introduced "aquifer" and "catchment" contracts, with two signed in 2019 and five ready for signature. In Tunisia, the preparation of IWRM plans in basins and aquifers is being piloted and short-term actions are carried out on some aquifers, using multi-actor dialogues or forums.

Several studies have supported the IWRM principles for river basins or aquifers in Lebanon without practical or continuous implementation of these concepts. The case of aquifers is particularly difficult because of the karst geology of Lebanon (more than 65 per cent) that does not make it easy to delineate aquifers and identify their resources. It is proposed to develop models adapted to the specific geologic features of the country and establish groundwater monitoring networks. Oman seems to be successful in the management of data and information sharing and reports that the ministry provides all hydrological and water data and statistics free of charge.

The five elements of financing of IWRM implementation (4.1a national budget for infrastructure, 4.1b national budget for IWRM elements, 4.2a subnational/basin budgets for infrastructure, 4.2b revenues raised for IWRM elements and 4.2d subnational or basin budgets for IWRM elements) relate to some extent to groundwater resources financing. However, only Oman mentioned that the water sector budget, allocated through five-year development plans, included aquifer recharge dams and water drilling and pumping, among other projects related to monitoring networks, operation and maintenance, research, studies and capacity building.

4.3 Shared water resources

Key findings and recommendations

1. Out of the 16 countries that reported on arrangements for transboundary water management (46, medium-low level), only two mostly implemented arrangement provisions. Two countries did not make any arrangements and four have not yet implemented the signed arrangements. **Therefore, most of the Arab countries need to sign agreements or conventions with their neighbours or speed up implementation of those that exist.**

2. The **transboundary organizational frameworks** (54, medium-high level) are partially implemented in the 14 countries that reported on them. Seven countries have at least partly fulfilled the mandate of this element. **The other seven need to establish joint cooperation mechanisms with their neighbours and enforce those in place.**

3. **Transboundary data- and information-sharing arrangements** (46, medium-low level) exist in 16 Arab countries but only two are implementing effective tools. Ten countries have ad hoc or limited arrangements for this important element. **Therefore, it is very important to develop and implement up-to-date tools to better monitor and manage transboundary water resources in the region.**

4. The **transboundary financing** (40, medium-low level) is the lowest among the four elements of this important water resource. The funding to support transboundary arrangements is less than fifty per cent of the needed amounts in 10 countries out of the 15 that reported on this element. **Therefore, most of the Arab countries need to mobilize more funds for the IWRM implementation to transboundary water projects.**

5. The **Maghreb sub-region** reports the highest levels of implementation across all transboundary elements of IWRM (73, high level). The GCC (50) and Mashreq (37) sub-regions score almost at the same medium-low level on average. The Southern sub-region has the lowest score in the low-level range (27). **Transboundary cooperation initiatives, including experience sharing and financial support, need to be enhanced in the region between performing countries and those that need improvement.**

6. The analysis of progress made by 10 Arab countries, between 2017 and 2020 on IWRM implementation to transboundary water resources, shows that substantial progress was achieved by four countries, moderate progress by two countries and limited or no progress by four countries. As such, the level of progress is limited on average. **Therefore, several countries need to work on improving their implementation rates to be on track for achieving the 2030 objectives.**

About two thirds of the available surface and groundwater resources in the Arab region are shared between neighbouring Arab countries and across the region's borders. 14 of the 22 Arab countries are riparian States with a shared waterbody and the region has 27 shared surface water basins. Apart from the Comoros, all the other Arab countries share one or more aquifers and shared groundwater basins covering almost 58 per cent of the region's surface area.[63] This high dependency, both from within and outside the region, makes cooperation between countries vital for achieving sustainable water management for all.

Some of the most important shared river basin systems in the Arab region are shown on maps below (figure 4.2).

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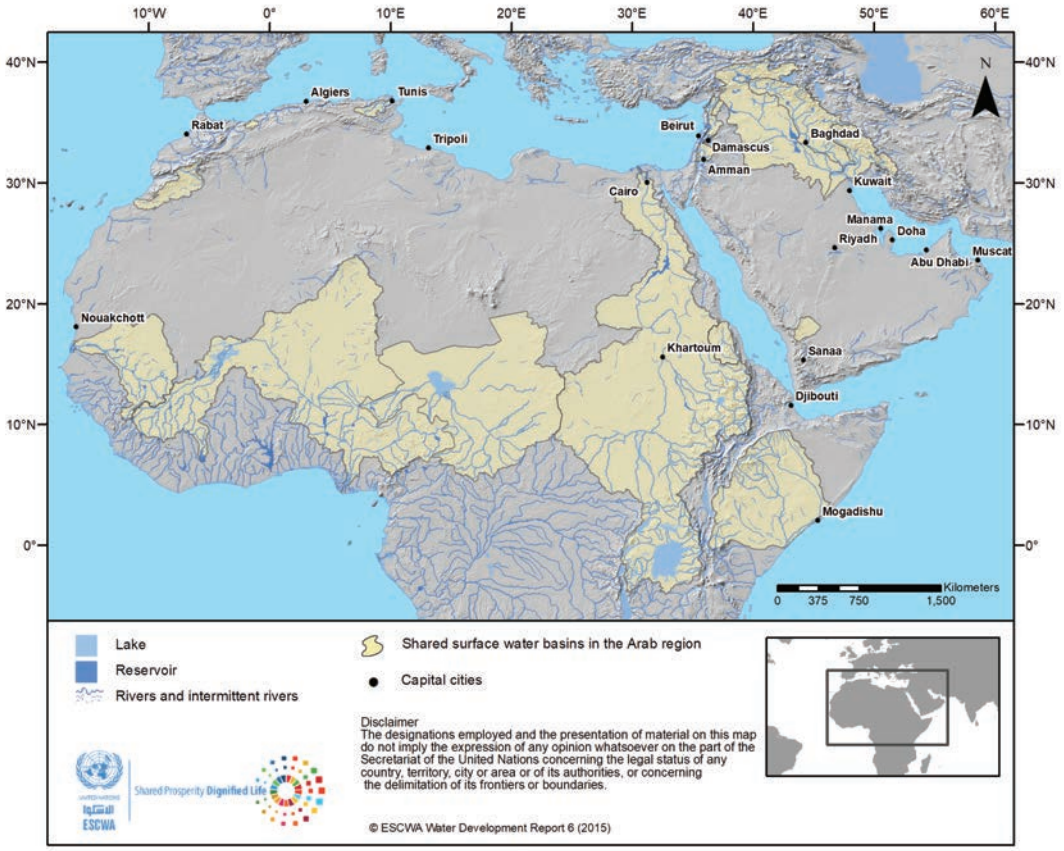
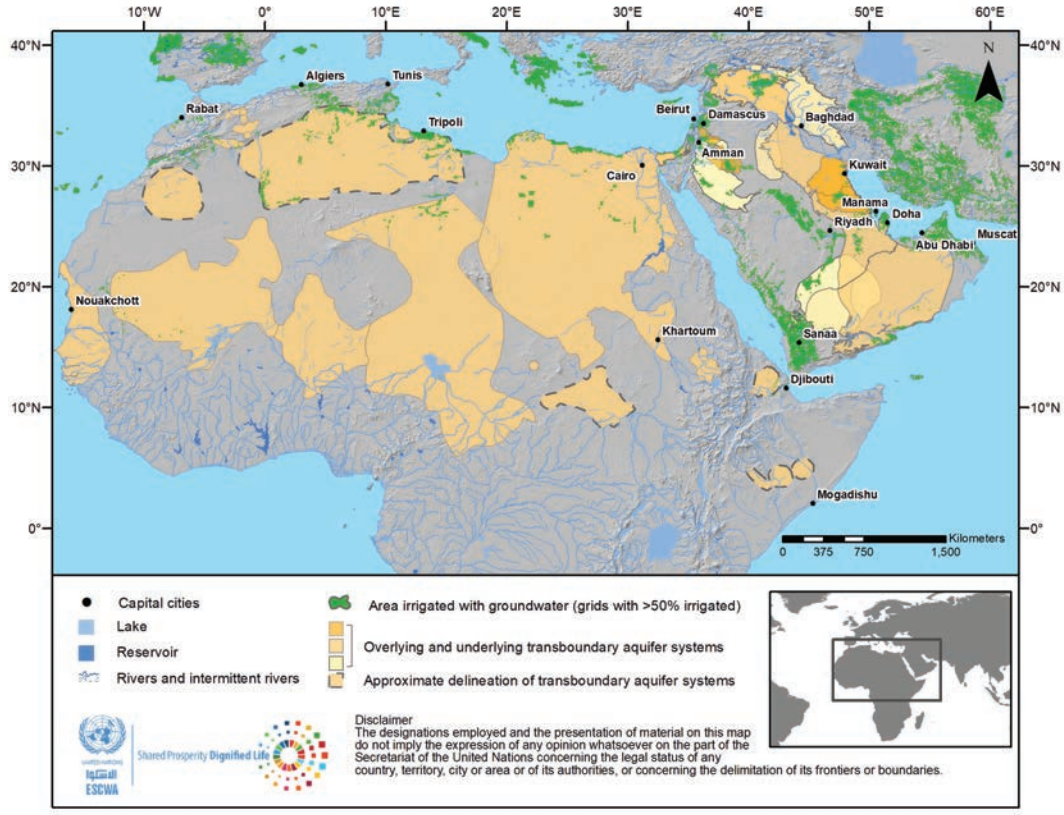
Figure 4.2 Maps of (a) transboundary river basins and (b) transboundary aquifers in the Arab region

(a)



(b)



Source: ESCWA Water Development Report 6: The Water, Energy and Food Security Nexus in the Arab Region (ESCWA, 2015), E/ ESCWA/SDPD/2015/2.

With regard to target 6.5, the 6.5.1 indicator advocates for IWRM implementation at the basin or aquifer level, irrespective of whether they cross international borders or other administrative borders, and the 6.5.2 indicator promotes specific operational agreements or other arrangements between co-riparian countries to ensure long-term and sustainable cooperation.[64] Monitoring IWRM implementation and transboundary cooperation support policymaking and decision-making by enabling countries to identify ways to accelerate progress.

Several cooperation modalities are in place in the Arab region[65,66,67] as well as at the regional[68,69] and the international[70,71,72] levels, however their effectiveness has varied and has been tied to the political will of concerned countries.

Four aspects of transboundary water cooperation are captured in the SDG 6.5.1 survey:

- 1.2c Arrangements: treaties, conventions, agreements or memoranda of understanding.
- 2.2e Organizational frameworks: joint bodies, mechanisms or commissions.
- 3.2d Data- and information-sharing: institutional and technical mechanisms established.
- 4.2c Financing: national contributions to support transboundary cooperation arrangements.

It is important to note that the transboundary elements of IWRM implementation have a smaller sample size than the other dimensions or elements. Four countries (Morocco, Oman, Qatar and Yemen) reported that the four transboundary elements were "not applicable" to them, while three reported on some of them, and 14 reported on all of them. Nonetheless, some of these countries do share water resources with their neighbours both within and outside the Arab region. Some concerns have been raised on the inclusion of transboundary component in the final IWRM implementation score for countries that have reported "not applicable" for these questions. However, it should be noted that reporting "not applicable" does not count in the average score calculation.

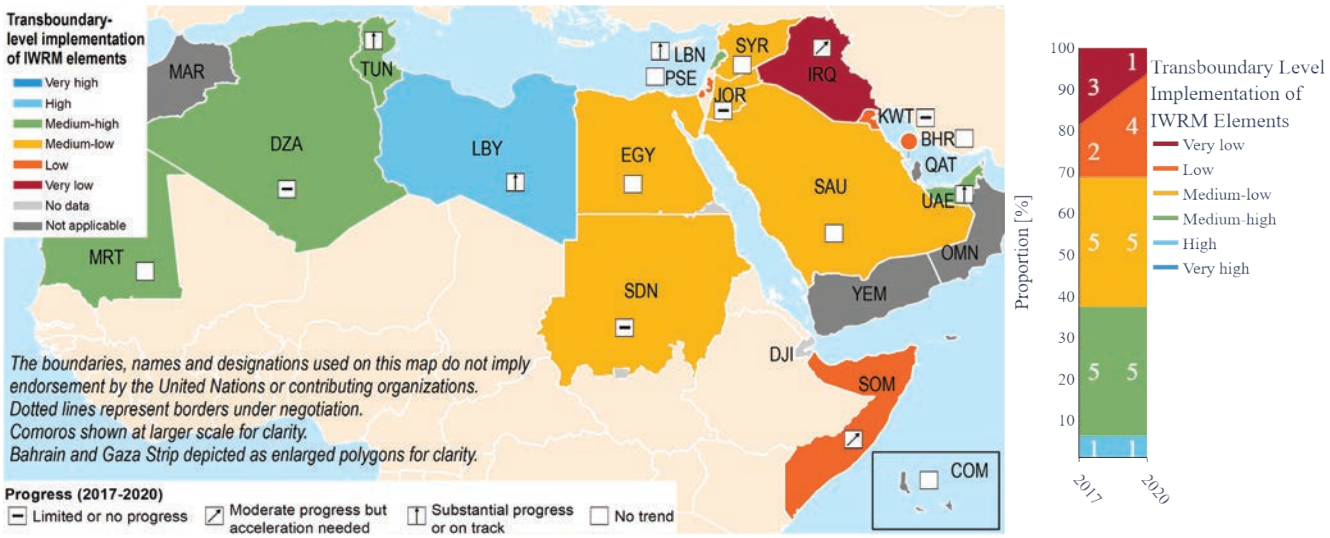
The analysis of the four elements devoted to transboundary IWRM, across the four dimensions of IWRM implementation, indicates that on average 10 Arab countries are performing at very low to medium-low levels (figure 4.3). Since most of the countries in the Arab region depend on transboundary water resources, this average implementation level needs to be improved.

An overview of the four elements dedicated to transboundary water management indicates that the region's capacity to implement transboundary organizations may be adequate in some countries (medium-high, 54), whereas more attention should be directed towards implementation of treaties, conventions and agreements (medium-low, 46) as well as establishing institutional and technical mechanisms for data- and information-sharing (medium-low, 46). Worth mentioning is the need for Arab countries to upscale financing to support transboundary cooperation arrangements (medium-low, 40). Although the regional score is adequate, this mainly reflects transboundary organization in a few countries in the region and other countries should increase efforts to institutionalize cooperation organizations.

It is hoped that dealing with some common challenges, like drought, water scarcity and climate change, would be the driving force for win-win situations and for some progress by riparian countries to establish solid bases for cooperation. Therefore, most Arab countries need to deploy great efforts by prioritizing cooperation on transboundary water resources and by addressing the observed shortcomings.

Some examples reported by the different countries are summarized in table 4.2.

Figure 4.3 Implementation status, per country, and progress made between 2017 and 2020 on transboundary water resources management



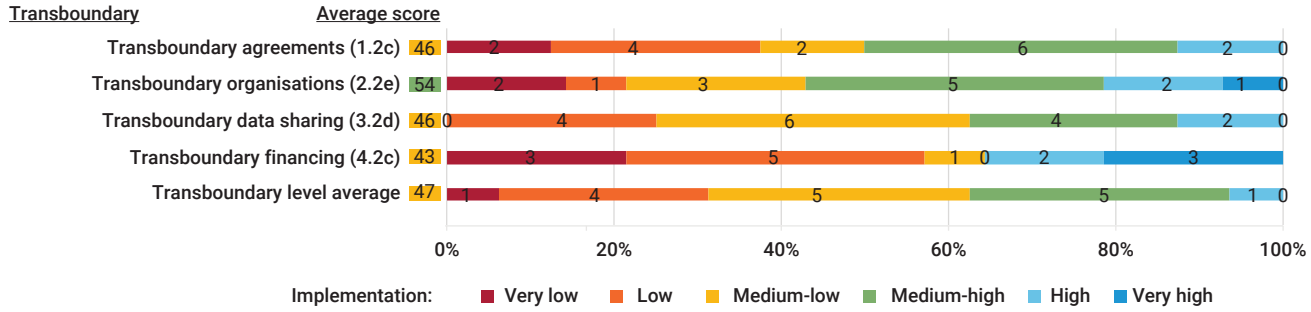


Table 4.2 Challenges and opportunities reported by some countries on transboundary water resources management

Country	Challenges/Opportunities
Iraq, 8 very low	Negotiations are under way with Saudi Arabia regarding investments for agriculture spaces. Non-formalized data exchange is cut off for a long time. Except for some grants from international organizations, there is no specific funding allocated from the State.
Bahrain, 15 low	Apart from some limited data- and information-sharing, there are no frameworks for the other three elements.
Somalia, 13 low	It is engaged in discussions at the regional level to develop the Intergovernmental Authority on Development[a] Water Policy and Water Protocol. It proposes funding allocation for a functional transboundary committee to undertake research, studies and capacity building of government staff.
State of Palestine, 28 low	It drafted a transboundary water resources strategy (2013)[b] without negotiating it with neighbours. Two organizations (Joint Water Committee and Joint Supervision and Enforcement Teams)[c] are in place but Israel does not respect their agreements.
Kuwait, 30 low	A proposal for arrangements, organizations and data sharing to be implemented for sharing the transboundary water among the GCC countries.
Egypt, 33 medium-low	Provisions for arrangements are partially implemented. The long-running dispute with Ethiopia over the Nile river has escalated recently.
Morocco, not applicable	It shares eight aquifers with Algeria and one with both Algeria and Mauritania.[d,e,f] Transboundary water is limited, localized and scarce. There is no cooperation with neighbours.
Algeria, 70 medium-high	It is satisfied with the cooperation with riparian countries regarding the North-Western Sahara Aquifer System.
Mauritania, 70 medium-high	It is satisfied with the Organization for the Development of the Senegal River.
United Arab Emirates, 70 medium-high	It is satisfied with the Water Resources Committee of the GCC Secretariat General.
Libya, 85 high	There are lively joint management bodies for three transboundary basins[g] and a regularly updated database for data and information sharing. There is a delay in securing required financial contribution from riparian countries. It suggests completing studies, developing mathematical models, extending data and information exchange to other sectors, and increasing funding from participating countries and from regional and international organizations.

Source: Based on country responses to SDG 6.5.1 survey.
Notes:
a. https://igad.int/(accessed on 5 September 2021).
b. Palestinian Water Authority, Transboundary Water Resources Strategy. Available at http://pwa.ps/userfiles/file/rwan/Final%20draft%20TransboundaryStrategy%20(2).pdf (2013).
c. The Hague Institute for Global Justice, Transboundary Water Cooperation over the lower part of the Jordan River Basin. Available at https://www.siwi.org/wp-content/uploads/2018/01/Jordan-Basin-Report_design.pdf (2017).
d. Africa Groundwater Network, Integration of Groundwater Management into Transboundary Basin Organizations in Africa. Available at https://www.gwp.org/globalassets/global/toolbox/references/trainingsmanual.pdf (2015).
e. Zarhloule Y. and others, "Water as parameter of cooperation between Morocco and Algeria: the case of Angad-Maghnia transboundary stressed aquifers of Bounaim-Tafna basin", in AQUAmundi, pp. 73-78 (2010).
f. Zekri S., Editor, Water Policies in MENA Countries (Springer Nature, Switzerland, 2020).
g. The Nubian Sandstone with Chad, Egypt and the Sudan, the North-Western Sahara Aquifer System with Algeria and Tunisia, and the Jafara with Libya and Tunisia.

Regarding arrangements with neighbouring countries, four countries (Egypt, Kuwait, the State of Palestine and Somalia) are in the process of preparing them while Bahrain and Iraq do not have any arrangements. Conversely, Libya and the Sudan have reported fully implemented provisions for this element.

At the level of the four sub-regions, on average, the Maghreb reports the highest levels of implementation across all transboundary elements of IWRM, with high level of financing (table 4.3). The GCC and Mashreq sub-regions score almost at the same level on average (medium-low). The GCC score is lowered by the arrangements (28, low level) that need to be accelerated. The Mashreq countries need to work on financing (low level, 13). The Southern sub-region scores in the low range (19) and countries need to improve organizations, data and information sharing as well as financing. The averages for the different sub-regions do not correlate with the average HDI values.

Table 4.3 Sub-regional average scores for implementation of transboundary cooperation elements in 16 Arab countries (with the number of countries between parentheses)

Transboundary elements	GCC	Maghreb	Mashreq	Southern	Region
1.2.c Arrangements	28 (4)	65 (4)	45 (6)	50 (2)	46 (16)
2.2.e Organizations	70 (2)	70 (4)	50 (6)	15 (2)	54 (14)
3.2.d Data sharing	43 (4)	65 (4)	40 (6)	30 (2)	46 (16)
4.2.c Financing	60 (2)	90 (4)	13 (6)	13 (2)	40 (15)
Average	**50**	**73**	**37**	**27**	**47**
Average HDI	0.829	0.669	0.711	0.490	0.699

Out of the 10 countries that reported in both 2017 and 2020, four (Lebanon, Libya, Tunisia and the United Arab Emirates) made substantial progress and seem to be on track for achieving the 2030 objectives, two (Iraq and Somalia) showed moderate progress and need to accelerate their level of IWRM implementation, while the other four have limited or no progress. On average, the level of progress in the Arab region is limited and the majority of countries need to work on improving their implementation rates. However, progress is sometimes limited by mutual willingness and political will for cooperation by concerned riparian countries, which may not be always possible and may affect progress on this component.

Regarding **transboundary arrangements** (46, medium-low level)**,** only eight countries reported that they were implementing provisions in transboundary arrangements, with provisions being mostly implemented by Libya and the Sudan. The difficulties facing some Arab countries in establishing cooperation agreements with their neighbours may be due in some cases to the nationalistic approach in water management, political conflicts or unwillingness of neighbouring countries to enter into such agreements.

The **transboundary organizational frameworks** have the highest average scores (54, medium-high level) of all elements related to transboundary cooperation. Iraq (zero, very low) did not describe its situation and Somalia (10, very low) mentioned the absence of a legal framework although it has established a committee for regional transboundary water cooperation. Nothing was mentioned by the Sudan (20, low) on this element but the country proposed cooperation with neighbours on the different shared basins through meetings, training sessions and workshops. On the positive side, all of the 11 remaining countries have established organizational frameworks, with the mandate being fully implemented by Libya, mostly fulfilled by the Syrian Arab Republic and the United Arab Emirates and partially activated by Algeria, Lebanon, Mauritania, Saudi Arabia and Tunisia.

The medium-low level IWRM implementation to **transboundary data- and information-sharing** (46) indicates that although data- and information-sharing arrangements exist in 12 countries (medium-low and above), four countries (Bahrain, Iraq, the State of Palestine and Somalia) report limited or no data-sharing. Therefore, this element is still a major barrier to effective transboundary collaboration in the Arab region. Algeria reported implementing the agreement under the North-Western Sahara Aquifer System consultation mechanism since 2006. Tunisia also mentioned this agreement and reported the lack of such an agreement with Algeria on the

Medjerda. Libya indicated that there was a database for the basin countries that was updated periodically. Lebanon stated that the data and information sharing arrangements with the Syrian Arab Republic on the transboundary river basins were implemented adequately. For Mauritania, the data sharing is done through the Organization for the Development of the Senegal River. The Sudan indicated the existence of a regional database between the four countries sharing the Nubian Aquifer without mentioning the level of implementation. It proposes as a way forward the training of technical staff. The United Arab Emirates claims that water-related data are shared periodically and annually through the Water Resources Committee of the GCC and the GCC Statistical Centre, in coordination with the Federal Competitiveness and Statistics Authority. However, two GCC countries did not mention this GCC mechanism as Kuwait states that there is a proposal under consideration that needs to be implemented and Saudi Arabia says that the arrangements are being implemented to a limited extent.

The transboundary financing in the Arab region is the lowest among the four elements of this important resource (40). This medium-low level of implementation indicates that the funding from countries to support transboundary arrangements is less than fifty per cent of the needed amounts. Out of the 14 countries that scored for this element, three (Mauritania, Tunisia and the United Arab Emirates) reported meeting all expected contributions for transboundary cooperation arrangements, two (Algeria and Libya) indicated meeting most of their contributions and the Sudan stated honouring a small part of contributions. Three countries (Iraq, Somalia and the Syrian Arab Republic) do not have any financing arrangement and five (Egypt, Jordan, Lebanon, the State of Palestine and Saudi Arabia) have adopted agreements but have not yet contributed to project implementation.

Tunisia declared contributing 30,000 euros annually for the North-Western Sahara Aquifer System consultation mechanism and that it would maintain this payment. Lebanon indicated exploring the possibility to join the 1992 UNECE Water Convention, which might help in raising financing for collaboration on transboundary basins. Egypt reported agreeing in 2012 to provide 5.3 million pounds (about $337,000) to implement several projects in the Nile Basin countries as part of the Nile Basin Initiative,[73] which is an intergovernmental partnership of the 10 countries on the river.

4.4 Relationship with SDG indicator 6.5.2 on transboundary cooperation

SDG indicator 6.5.2 measures the proportion of transboundary area under an operational arrangement. It complements indicator 6.5.1, which tracks the degree of IWRM implementation at all levels, including on transboundary water resources. Under indicator 6.5.2, an arrangement is considered to be "operational" when the concerned countries are engaged in a joint body or mechanism, meet on regular basis, share data and information, and have coordinated management plans or objectives for the basin(s).[74]

Only 12 Arab countries contributed to the second monitoring exercise of SDG indicator 6.5.2 making it difficult to draw any comparative conclusions with the SDG indicator 6.5.1, for which 14 countries reported on all the transboundary elements while three reported on some of them. Out of these 12 countries, only eight provided scores for the river and lake component, with 100 per cent for Egypt, 76 per cent for Lebanon, 62 per cent for Jordan and between zero and 15 per cent for the other four countries. Eight countries reported on the aquifer component with 100 per cent for Tunisia, 98 per cent for Libya, 58 per cent for Algeria and between zero and 15 per cent for the other five countries.[75]

In future rounds, it would be useful if reporting on 6.5.1 and 6.5.2 were more closely coordinated and results unified at the national level, with further collaboration between UNEP, UNECE and the United Nations Educational, Scientific and Cultural Organization (UNESCO) along with coordination support from UN-Water and ESCWA.

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Accelerating full implementation of IWRM

5

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5.1 Political context for IWRM implementation in the Arab region

Within the framework of sustainable development, several national and regional sectoral strategies and policy documents prioritize IWRM implementation. The guiding document is the ASWS (2010-2030) and its accompanying action plan.[76] These two documents present key policies adopted by the AMWC of the League of Arab States in 2012 and 2014, respectively. The fifth objective of the ASWS stresses the importance of establishing the IWRM principles as a key element in water policies in Arab States. The ASWS complements several Arab initiatives, including the Strategy for Sustainable Arab Agricultural Development (2005-2025) and the GCC Unified Water Strategy (2016-2035), among others.

Arab States have adopted the 2030 Agenda and committed to achieving the SDGs and more explicitly SDG target 6.5, thus reaffirming IWRM implementation as an important mechanism for achieving sustainable development and efficient management of water resources.

The International Decade for Action (2018-2028), "Water for Sustainable Development", commonly referred to as the Water Action Decade, was proclaimed by the United Nations General Assembly in 2016, pursuant to resolution A/RES/71/222. The Decade aims to increase focus on the sustainable development and integrated management of water resources to achieve social, economic and environmental objectives, implement related programmes and projects, and foster cooperation and partnership at all levels to help achieve internationally agreed water-related goals and targets including those of the 2030 Agenda. A midterm comprehensive review of the Water Action Decade is planned at the United Nations headquarters in New York in March 2023 to report on progress made in implementing the Decade's objectives, identify possible obstacles in achieving them, and pinpoint innovative ways to support their implementation and accelerate progress.[77] The conference is preceded by regional and global meetings with preparations that include a review process and a progress report to be issued under the auspices of the Secretary General at the global level.

The Water Action Decade has been endorsed in the Arab region as demonstrated by resolutions and recommendations adopted by Arab States in intergovernmental and regional forums, including by the AMWC, the ESCWA Committee on Water Resources, and the UN-Water Expert Group on Regional Level Coordination, which supports regional preparations for the midterm comprehensive review.

In this context, ESCWA was mandated to lead regional coordination in preparation for the midterm comprehensive review of the Water Action Decade in collaboration with the League of Arab States secretariat and regional organizations, which will be preceded by an Arab Regional Preparatory Meeting planned in 2022. This involves activating the engagement of regional stakeholders, implementing activities that explicitly support the Water Action Decade in the region, and preparing the regional contribution to the global midterm comprehensive review report based on regional exchanges on progress achieved, lessons learned and challenges affecting the achievement of water-related SDGs in the region.

The Decade and its review process are firmly grounded in promoting the implementation of IWRM as the Decade's objectives explicitly focus on IWRM and are pursued by emphasizing modalities that mirror IWRM-related dimensions.

Additionally, IWRM represents a fundamental regional priority area as expressed in the outcome document that consolidated regional views and priorities on water-related issues facing the Arab region.[78] The document is based on consultations held at the Regional Preparatory Meeting on Water Issues, which was convened a week after the launching of the Water Action Decade (Beirut, 28-29 March 2018) and informed the 2018 AFSD and the HLPF. The following priority areas were identified and selected among the regional priorities to report on for the Water Action Decade regional process: (1) Strengthening IWRM to cope with water scarcity; (2) Enhancing cooperation on shared water resources; (3) Considering water as a core component of climate change adaptation and natural disaster risk reduction; and (4) Access to water services for all through improving water-related infrastructure.

Achieving the Water Action Decade's objectives is thus firmly linked with achieving IWRM principles. In tandem, regional preparations in the Arab region for the midterm comprehensive review of the Water Action Decade fall under different global, regional, national and institutional frameworks that all converge towards advancing action on IWRM. As part of the Fifth Arab Water Forum (Dubai, September 2021), a dedicated session was organized on accelerating action on IWRM for sustainable development through the Water Action Decade. It discussed the progress achieved in IWRM implementation to support the Water Action Decade objectives. The Decade thus provides a unique opportunity to activate, accelerate and sustain the action of all stakeholders towards IWRM implementation in the region, and serves as a powerful political platform to voice Arab concerns and challenges in fully achieving IWRM objectives. As a comprehensive quantitative assessment of regional IWRM progress, findings and recommendations from this report will be drawn upon to inform the Decade's regional preparatory process and reporting, which can in turn mobilize the needed action to help achieve internationally agreed water-related goals and targets.

5.2 Summary of findings on SDG 6.5.1 in the Arab region

This regional report for SDG indicator 6.5.1 aims to present the progress achieved for IWRM implementation in the Arab region since the initial regional report prepared in 2019 and to identify priority areas that can help accelerate progress towards full implementation.

The report is based on data from 21 out of 22 Arab States, including the State of Palestine, which submitted its report for the purposes of this regional analysis. Of these, 15 countries have data for both 2017 and 2020, allowing for analysis of progress towards the target, four countries re-used their baseline submissions for reporting in 2020 (Bahrain, Egypt, Mauritania and Saudi Arabia), while two countries submitted data for the first time (the State of Palestine and the Syrian Arab Republic). It is remarkable that significant attention was given by countries to the reporting process despite the special circumstances linked to the COVID-19 health crisis and other political and economic challenges mentioned by numerous countries in the region.

The average level of implementation of IWRM in the Arab region is in the medium-high range (53), similar to the world average (54) (section 2.1). Considering that the global target for indicator 6.5.1 is to reach a very high degree of IWRM implementation (91 and above) by 2030 and that the ASWS (2010-2030) has prioritized IWRM as a key element in water policies in Arab States, the current rates of implementation need to be accelerated. For the water-scarce Arab region, failure to accelerate IWRM implementation threatens the ability to balance the social and economic demands on water, and hence the achievement of other SDG targets, such as those on water supply and sanitation, agriculture, energy, health and gender.

Between 2017 and 2020, the average regional IWRM implementation increased from 48 to 53 (similar to the global increase from 49 to 54). However, the rate of implementation needs to double in order to reach the global target**.** With a business-as-usual scenario, the Arab region is off-track to reach the SDG 6.5.1 target. Interestingly, several Arab States have demonstrated a good ability to rapidly improve their IWRM implementation rate between 2017 and 2020. On the other hand, some countries made limited to no progress during the same period (section 2.1). In order to avoid the status quo and scale up efforts towards full implementation, these countries need to identify and act upon their weaknesses. Besides, success stories and good practices should be shared among countries to accelerate progress throughout the region.

Through their responses to the surveys for SDG indicator 6.5.1, the 21 reporting countries in the Arab region have identified the main constraints that they are facing to apply IWRM principles to the various aspects of water management. Needless to say, these also constitute the priority areas they must address to progress towards full IWRM implementation (section 2.3).

While each country context is different, seven key priorities stand out: strengthening political will; coordinating financing and leveraging climate financing; ensuring coherent governance and cross-sectoral coordination; promoting data sharing and knowledge management; building capacity and engaging research; leveraging innovation and technologies; and unleashing female and youth potential. Recommendations on accelerating actions in each of these seven priority areas are provided in the remaining sections in this chapter.

5.3 Strengthening political will

Regional and global context: in the Arab region, ministers in charge of water have clearly expressed the political will to advance IWRM by ensuring that its principles are among the building pillars of the ASWS (2010-2030) adopted by the AMWC of the League of Arab States in 2012. In March 2018, the experts meeting convened by ESCWA in collaboration with the League of Arab States placed IWRM among the priorities of the HLPF Working Group established under the auspices of the AMWC.[79]

At the global level, strengthening political will through advocacy and communication is recognized to be a key enabler for advancing IWRM.[80]

Key recommendations: high-level political will is essential for achieving sustainable water resources management in the Arab region. This support is necessary for planning appropriate projects and programmes, deciding on the timing for their implementation, mobilizing sufficient human and financial resources, and establishing follow-up mechanisms to maintain momentum for effective and efficient execution. Some recommendations for strengthening political will include:

- **Communicate the value of IWRM concepts at high government and strategic levels:** promote knowledge and understanding in the decision-making spheres on how implementing IWRM can help achieve multiple sustainable development objectives. Given the high-level targeted audience, specific approaches need to be utilized such as the organization of thematic leader's summits, the design of high-impact policy briefs, etc. These actions can be convened by regional political organizations such as the League of Arab States and the GCC.
- **Involve finance ministers as champions for IWRM implementation:** given the importance of financing to

accelerate IWRM implementation and taking into account the competition between several sectors to access limited government funds, strong advocacy is needed to mobilize sufficient budgets for water resources management and investment in water infrastructure. While ministers in charge of water have the primary responsibility to make the case for water, involving finance ministers as champions for IWRM can raise water issues on the political agenda and accelerate implementation by making better use of existing financing and attracting additional resources. Interesting lessons can be drawn from initiatives in the WASH sector such as the organization of a Finance Ministers' Meeting during the Sanitation and Water for All High-Level Meetings since 2009.[81]

- **Mitigate the effect of potential political turmoil on IWRM implementation:** IWRM is key to building a water-secure future in the Arab region and progress towards full implementation needs to be accelerated regardless of the political turmoil or frequent changes in government cabinets experienced by some Arab countries. This could be facilitated by the establishment of supreme councils for IWRM that are convened by the highest leadership level in the country to foster long-term strategies and ensure continuity and sustainability of actions, such as the Supreme Council for Water and Climate in Morocco, the Dubai Supreme Council of Energy and the Supreme Council for Environment in Bahrain.

5.4 Coordinating financing and leveraging climate financing

Effective water governance depends on coherent financing mechanisms. It is also important to identify the financing needs, sources and the allocation of financial resources. Effective and efficient financial arrangements are required to ensure effective IWRM implementation as finance and good water governance are inextricably linked.[82] Only few countries have sufficient funding for the water infrastructure required to achieve the SDGs. Therefore, public funds need to be combined with other financing sources, including private investment.[83] The three major sources of funds for water and sanitation are taxes from individuals and businesses; transfers such as overseas aid, remittances or market interest rate lending; and tariffs paid by households, businesses and governments.[84] Furthermore, financing was identified at the global level as one of the accelerators of the SDG 6 GAF that allows countries to implement their IWRM plans.

The financing dimension of IWRM implementation reflects the extent to which the financial resources available for water resource development and management are appropriate or sufficient. This dimension exhibits the lowest level of IWRM implementation in the region (medium-low, 46) and insufficient financial resources are the most common constraint raised by countries (box 5.1). The fifth performance indicator of the ASWS (2010-2030) is to "increase the amount of funding available for the water sector and build an Arab industrial and technological base in this field", with focus on increasing investments in the water sector, private sector contribution in financing and management of water projects, and volume of production and usage of Arab-made products in all water-related fields.

Box 5.1 Financing and investment as a means of IWRM implementation

The Regional Preparatory Meeting on Water Issues for the 2018 AFSD and the HLPF, held in March 2018 in Beirut, recognized that financing and investment can provide significant leverage for IWRM implementation through:

- Encouraging funds, banks and potential donors to support the achievement of the water-related SDGs and targets in Arab countries, including investments in water supply and wastewater treatment.
- Developing cost recovery strategies for water supply and sanitation, taking into account affordability for the poor.
- Exploring tools for estimating the cost dimensions of SDG implementation, while encouraging Arab States to advance water sector reforms to facilitate receipt of SDG-related financing.
- Promoting the establishment of incentives programmes for implementing the 'polluters pay' principle.
- Promoting financing for innovative regional initiatives to enhance shared basin cooperation.
- Developing and strengthening national legislation to support public-private investments.
- Using foreign direct investment to encourage the transfer of new technologies.

Source: E/ESCWA/RFSD/2018/CRP.2.

Financing the water sector can further benefit from accessing climate-related finance through integrated national financing mechanisms. In their NDCs, countries lay out their key commitments and needs to reduce national emissions and adapt to the impacts of climate change. Countries also report the means of implementation of these commitments (i.e. finance, technology and capacity building). These NDCs and other reports and communications by countries under the Paris Agreement reveal that the water sector is a priority area for climate adaptation in the region. 18 Arab countries identified needs and priorities at the water sub-sector level related to wastewater treatment, desalination, water harvesting, irrigation and early warning systems.[85] The estimated cost of those needs amounts to $127.46 billion, which is considered as the highest estimated cost of identified needs per sector for adaptation with mitigation and adaptation co-benefits, including those for agriculture, food security, health and coastal zones.[86]

Overall, water represents around 29 per cent of total costed needs for both adaptation and mitigation, yet it only receives 14 per cent of climate finance flows (i.e. international public or private and domestic public or private climate finance).[87] Flows into the region over 2013-2018 were mostly targeted at climate mitigation projects at 77 per cent, with adaptation at 18 per cent (30 per cent when including projects with co-benefits) and cross-cutting projects at 5 per cent. Under adaptation projects, WASH activities feature most prominently and receive a high proportion of flows. Although current climate finance is targeting, to a certain degree, the water needs, it is not in the required volumes nor in the required type as dominating flows come from Multilateral Development Banks in the form of concessional loans. Furthermore, access to climate finance is uneven across the Arab region, and flows are concentrated in four to five countries.[88] This reflects both the gap in the comprehensive estimate of climate finance needs in the region and challenges in accessing climate finance.

ESCWA is currently coordinating a climate/SDGs debt swap mechanism for countries in the region. The debt swap exempts member States from interest payments on external debt, allowing them to invest these funds in needed climate change mitigation and adaptation projects. Debtors benefit by including the written off interest payments as part of their official development assistance. A pilot of the debt swap is under way in Jordan with the potential to expand to other countries in the region.[89] Arab countries can explore this mechanism for water sector funding.

In 2020, Egypt became the first Arab country to issue green bonds. The amount of $750 million raised through the issuance of green bonds is directed towards financing sustainability projects in the transportation and energy sectors.[90] Similar fixed-income instruments could be feasible solutions for financing projects in the water sector. Egypt is also seeking private sector investment in desalination plants for the country (box 5.2).

Key recommendations

- **Improve coordinated finance mechanisms for the water sector at the national level to attract additional funding:** the effort in financing the water sector and water-related SDGs must be increased through more coordinated national financing across various ministries and institutions. Attracting more funding requires the proper enabling environment. Arab States should provide the necessary policies and regulations to attract new funding and new partnerships with the private sector.
- **Increase access to climate finance for the water sector:** as the world is recovering from the COVID-19 pandemic, many developing countries have been calling for increased finance for adaptation so that it equals finance for mitigation, emphasizing that adaptation should be central to recovery. Consequently, increasing adaptation finance for water is imperative. In this context, as countries are updating their NDCs and developing their national adaptation plans, they need to refocus their priorities and needs in alignment with their national water strategies in terms of cost estimates and timeframes. Arab Countries need to further quantify their needs and explore new and innovative instruments of finance to implement those strategies. At the same time, more international climate finance should be unlocked (box 5.3).

Box 5.2 Making use of climate finance in the water sector

During the 2021 AFSD, the Egyptian Minister of Environment emphasized the importance of directing climate-related finance towards priority national issues; in other words, making use of climate finance to solve the country's problems. Egypt succeeded to issue first sovereign green bond in the Arab region, which raised $750 million for national projects in September 2020. Sustainable management of water and sanitation is a key area for selected projects. The Minister further highlighted how the green bonds and Egypt's environmental sustainability standards were the result of a long and close coordination process between the Ministry of Environment, the Ministry of Finance, the Cabinet as well as the private sector, driven by a strong political will. This is one example of innovative financial instruments that can be considered at the country level to facilitate access to climate finance in the region with benefits to the water sector.

Sources: ESCWA, UNEP and UNDRR, Background Note on SDG 13 "Climate Action" (AFSD 2021); AFSD 2021, Plenary Session, SDG 13 Review.

Box 5.3 Existing key international finance sources

Several international multilateral funds give priority to developing countries such as the Global Environment Facility Trust Fund that provides a variety of funding packages, including project preparation grants, the Adaptation Fund, managed by the Global Environment Facility, and the Pilot Programme for Climate Resilience administered by the Climate Investment Fund.

Vulnerable developing countries can access the Special Climate Change Fund for adaptation and technology transfer projects that focuses on innovation, and the Least Developed Countries Fund for funds preparation and implementation of national adaptation programmes of action.

The Green Climate Fund targets paradigm shift projects and gives priority to developing countries directly affected by climate change. Some funds are dedicated to African countries such as the Africa Water Investment Programme and the African Water Facility hosted by the African Development Bank. The Global Climate Change Alliance Plus funds multi-year large programmes and is accessed through the country's European Union delegation.

Sources: https://www.thegef.org/about/funding; https://www.adaptation-fund.org/apply-funding; https://www.climateinvestmentfunds.org/topics/climate-resilience; https://www.thegef.org/topics/special-climate-change-fund-sccf; https://www.thegef.org/topics/least-developed-countries-fund-ldcf; https://www.greenclimate.fund/; https://aipwater.org/; https://www.africanwaterfacility.org/en/about-awf/donors-funding/; https://www.gcca.eu/.

5.5 Ensuring coherent governance within and across sectors

Regional and global context: Arab countries have acknowledged that the coordination and integration of governance arrangements within the water sector and across other water-related sectors is a priority area to progress towards the 2030 objectives for SDG 6.5.1 (section 2.3). This is in line with the recommendations of the water experts meeting convened in March 2018 by ESCWA in collaboration with the League of Arab States. At the meeting, IWRM was considered as one of the most important mechanisms for achieving sustainable development in the Arab region, thus calling for inter-sectoral integration for the sake of harmonization, planning and implementation, and the realization of economic and environmental returns for all sectors.[91]

At global level, one of the key recommendations for advancing IWRM is to prioritize and strengthen coordination within the water sector and with other sectors.[92] Coherent governance and coordination across boundaries and sectors are also among the five accelerators to achieve SDG 6.[93]

Key recommendations: some success factors for coherent governance arrangements include:

- **Improve the enabling environment:** establishing an appropriate legal framework is a key driver to accelerate IWRM implementation. In most Arab countries, water laws exist but need to be amended and/or updated to introduce and/or consolidate IWRM principles (Oman and Somalia). The preparation and implementation of application decrees for laws need to be sped up (Lebanon). Countries such as Libya, Oman and the United Arab Emirates pointed to the fact that water legislation and plans should also address the coordination with relevant sectors including agriculture, (renewable) energy, health and environment. Algeria and Morocco reported the establishment of water basin councils and participatory management contracts at the basin/aquifer level as an interesting approach to strengthen stakeholders' participation for improved water resources management.

In addition to the efforts needed to increase financial resources for the implementation of IWRM plans, several Arab countries such as Egypt, Oman and Tunisia have included in their focus areas the need to strengthen monitoring and evaluation systems, and establish standardized sector indicators. In some Arab countries, political stability is also an important factor to guarantee the continuity of water governance arrangements.

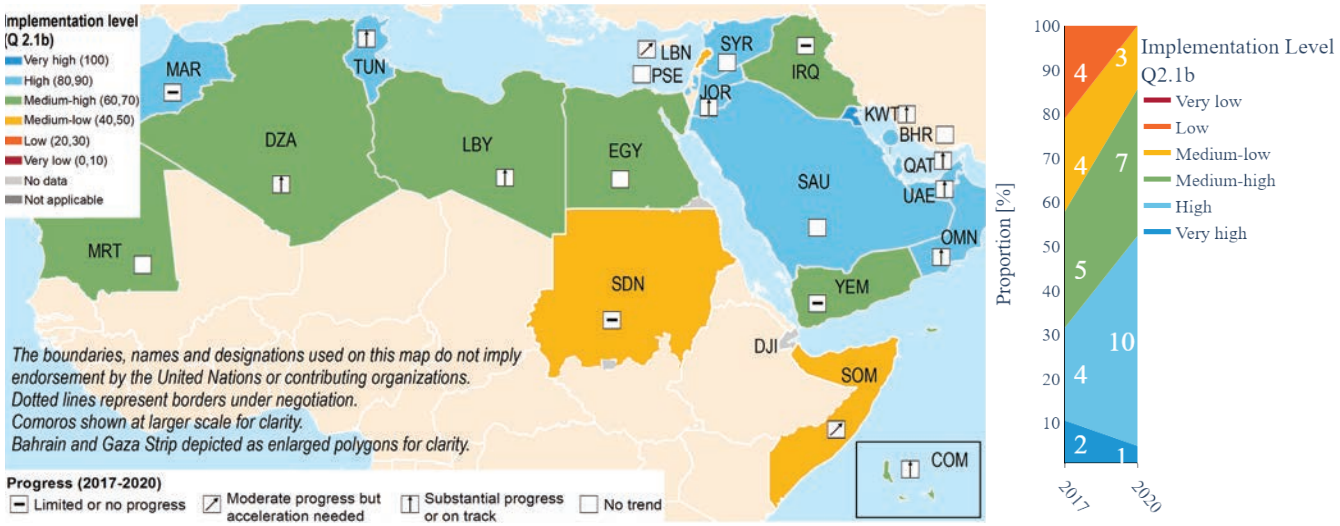
- **Strengthen coordination within and outside the water sector:** strong political commitment is a key driver for effective coordination within the water sector and across sectors. This can first be achieved by establishing national and subnational government authorities and providing them with clear mandates and technical, human and financial capacities to lead the implementation of effective IWRM plans (Iraq, Lebanon, Morocco, the State of Palestine and Somalia). The second important aspect is to prioritize increased coordination between institutions leading IWRM implementation and other water-related agencies and establish formal consultation mechanisms (Jordan, Oman, Somalia and the United Arab Emirates).

Arab States have already acknowledged the importance of cross-sectoral coordination and significant progress was achieved for this element between 2017 and 2020 (section 3.2). In order to avoid overlaps and working in

silos, most Arab countries have established some degree of coordination between water-related sectors such as WASH, agriculture, energy and environment. Moving forward, countries will need to clearly delimit the sphere of responsibility for sectoral institutions and strengthen formal accountability mechanisms. Moreover, cross-sectoral coordination should be extended to other sectors that play an important role in IWRM implementation in the Arab region such as finance, industry and tourism.

- **Make public participation inclusive:** public participation is provided for in water legislation in most Arab States although in some countries, sharing of information, communication and consultation with the public are carried out on an ad hoc basis, and must still be formalized. In practice, mechanisms for implementation at national and local levels need to reach out to the various categories of stakeholders including basin committees, water users' associations, civil society, academia, local and ethnic communities and vulnerable groups. Some countries such as Morocco, Oman, the Syrian Arab Republic and Tunisia are involving civil society, local stakeholders and water users in decision-making related to the planning, financing, operation and maintenance of water projects. This will help increase efficiency and enforce regulation and accountability for the sustainable management of water resources mainly in terms of water allocation, availability and quality.
- **Leverage private sector participation:** recent reforms by public authorities in several Arab countries (Algeria, Egypt and Lebanon) have included private sector participation in legislation for water resources development, management and use. This approach is driven by the need to increase water investments and improve the means and capacities of public management companies. It is often supported by international partners and seeks to mirror the existing frameworks for investing in energy projects. Successful private sector participation in IWRM in the Arab region will require the strengthening of regulatory frameworks and public authorities' capacity to deal with relevant contracts. In particular, aspects related to monitoring and credibility, through the provision of transparent and publicly accessible reporting on the use of revenues and safeguards, need to be established.

Figure 5.1 Cross-sectoral coordination map with progress 2017-2020



5.6 Improving availability and access to data and information

Regional and global context: good knowledge and understanding of the state of water resources both for quantitative and qualitative aspects are of paramount importance in the water-scarce Arab region. The ASWS recognized the importance of water information and data monitoring for sound planning and for the development of appropriate policies to manage water resources. This is particularly true for shared water resources within the region and for major river basins shared with non-Arab States.[94]

Improved data and information are defined as one of the five accelerators for the SDG 6 GAF. Data generation, validation, standardization and information exchange will build trust so leaders can make informed decisions and increase accountability.[95]

Key recommendations: while priorities and means vary between regions and countries, international good practices for data and information management and use can be summarized as follows:[96]

- Develop or enhance an online national information system (or similar) for the coordinated management of water resources.
- Secure funding for establishing and operating monitoring networks.
- When developing legal and operational arrangements for cross-sectoral coordination, include provisions for data and information-sharing.
- Harmonize and standardize data collection and sharing methods, develop management, and exchange protocols to allow subnational data to be interpreted and collated at the national level.
- Encourage the private sector, international partners, non-governmental organizations and academic institutions to share water data that may be of national interest.

In the Arab region, specific areas of action are identified below:

- **Expand and modernize national monitoring of water availability:** Lebanon has established an action plan that includes creating an enabling environment (consultation activities, training, etc.) and a governance structure to implement and manage the national water information system as well as undertaking the necessary investment to ensure data production, storage, processing and access for stakeholders. The Sudan and Tunisia emphasized the need to develop, modernize and expand monitoring networks, especially for groundwater resources. Several countries including Jordan, Lebanon, Morocco, Oman and Somalia stressed the importance of building institutional and human capacity for the efficient use of modern monitoring systems and equipment for groundwater and reservoir management.
- **Systematize data and information sharing within countries:** in some countries, data and information sharing are limited and mostly on an ad hoc or project basis. The implementation of a national water information system at the level of each basin with consolidation at the national level will allow for effective collaboration with key stakeholders such as ministerial departments and water institutions. In Morocco, for example, this is required by the water law. Lebanon is also in the process of integrating the need to set up a national water information system in water laws and protocols or decrees, including a specification of the modalities that will regulate the sharing of information among different institutions and authorities.
- **Prioritize transboundary data and information sharing between countries:** given the importance for the region, arrangements for data and information exchange for transboundary water need to be formalized and strengthened. Suggestions from countries include the establishment of an official online portal shared by all countries for the exchange of data and information. The data and information exchange mechanism could also be extended to other sectors (Libya). A good example for transboundary water data and information sharing is provided by the Organization for the Development of the Senegal River that gathers Guinea, Mali, Mauritania and Senegal.

5.7 Building capacity and engaging research

Regional and global context: the ASWS listed institutional development among the key objectives for achieving sustainable development.[97] This domain includes human and technical capacity development, the promotion of social and individual awareness of water issues, scientific research and the promotion of civil society participation in decision-making. Two specific objectives were listed in the strategy, namely: (1) strengthening the role of scientific research in IWRM; (2) promoting the development and qualification of human resources. The ASWS also noted the inadequate role and contribution of scientific research and technology transfer in the water sector. In addition, the SDG 6 GAF identified gaps in the institutional and human capacity as well as in research and innovative practices that slow down SDG 6 implementation.[98] In order to accelerate progress, countries need to focus on human capacity because previous output-based approaches did not pay sufficient attention to education and training as well as attracting and retaining the skilled workforce needed to deliver water and sanitation services. Capacity development, performance monitoring and evaluation are essential for improving service levels. The 2019 Global Sustainable Development Report identified science and innovation as prerequisites for designing and implementing transformations to sustainable development.[99] Therefore, member States are required to invite higher education institutions, policymakers and research funders to scale up research, guided by the 2030 Agenda.

Key recommendations: some countries reported on the need for staff development in terms of training, advancement and retention, as well as studies and applied research.

- **Improve human capacity:** with the increasing pressure of the scarce water resources and rapid developments in technology and water use methods, water operators need to recruit well-trained water professionals, inclusively across gender and socioeconomic groups, and raise awareness about the importance of IWRM among both employees and water users. Moving toward a more decentralized, participatory and market-driven approach, substantial investment is required in the upgrading of the skills, knowledge and attitude of all personnel, particularly

those who work at the field level. Several IWRM training programmes are offered by several and diverse institutions in the Arab world (academic institutions, regional and international organizations, and water operators). These cover the formative primary and secondary school years, vocational training, university professional training and continuing education programmes (workshops and short courses).

- **Leverage innovative practices and technologies for water and sanitation:** despite the presence of several research institutions in the region, most countries still rely on imported know-how and equipment. The support of scientific research and innovative methods is a must for better management tools, technology development and transfer, and innovation. Several examples may be given, such as the use of technology in management and operations of water resources, business models, wastewater treatment, water desalination, irrigation, crop selection, cultivation methods and clean energy. Coordinated efforts for a wide application of a nexus approach is needed in order to maximize synergies and minimize trade-offs across and within sectors.

Very few countries reported on these very important elements for accelerating IWRM in the Arab region. Some of the budget in Oman is used for research, studies, capacity building and skills development. Kuwait has carried out many hydrogeological studies to exploit the aquifer's potential. Several studies have supported the application of IWRM principles to river basins and aquifers in Lebanon. Somalia is proposing some funding allocation to undertake research, studies and capacity building of government staff. Libya suggests completing studies and developing mathematical models.

5.8 Leveraging innovation and technologies

Regional and global context: the importance of innovation and technology for tackling water challenges is highlighted in several regional and global processes. At the regional level, the importance is highlighted in the ASWS theme 2 on scientific research and transfer and localisation of modern technology, and in theme 7 on increasing the efficiency of water use. At the global level, the importance of innovation is addressed through SDG 17 on strengthening the means of implementation with special focus on technology, and more specifically in SDG 6, target 6.a on means of implementation regarding international cooperation over technologies. It is also addressed through the SDG 6 GAF that focuses on innovation as one of the accelerators in terms of new, smart practices and technologies to improve water and sanitation resources management and service delivery.[100,101,102]

Key recommendations*:* in the current reporting exercise, some suggestions were provided by countries on how to leverage innovation and technologies to accelerate IWRM implementation in the Arab region:

- Promote fit-for-purpose technologies: several Arab countries have clearly identified their specific needs in terms of development and use of water technologies and have undertaken important steps towards the implementation of technologies that best answer those needs. Oman is seeking to use modern and less expensive technologies to expand the utilization of treated wastewater in agriculture, increase water use efficiency and harness various water harvesting techniques, including the construction of underground recharge dams and fog water harvesting. Qatar is going for the establishment of advanced water laboratories with modern equipment, tools and technologies to monitor water quality in line with local and international standards. For its part, the Sudan is engaging in digital water technologies such as the installation of data loggers to improve the effectiveness of aquifer management.

Undeniably, digital water technologies are especially promising in the Arab region where there is an urgent need to develop innovative approaches to solve water scarcity and water quality challenges. The emergence of technologies such as remote sensing, inexpensive sensors, smart devices and artificial intelligence can enable real-time water quantity and quality monitoring, improved management of infrastructure assets and direct consumer engagement. Satellite imagery can be used for surface and groundwater evaluation and flood forecasting, and blockchain technology can provide a collective record-keeping of water data, allowing multiple stakeholders to create and use an indisputable set of data.

As Arab populations are increasingly embracing digital technologies in all aspects of their lives, digital water technology solutions can also help improve inclusive participation in water resources management.

- **Engage in innovation beyond technology**: accelerating full IWRM implementation in the Arab region demands to step away from the usual way of doing things. Significant potential for innovation lies in non-technological areas and some Arab States have become aware of the value of innovation in finance (Morocco), public participation (the United Arab Emirates) or regulation of water services (Tunisia).

While several Arab countries are introducing innovative approaches to managing water resources, many

bottlenecks still need to be overcome such as scaling up successful initiatives and securing long-term investments for water innovation. Some interesting ideas for addressing these gaps can be found in the analysis of the dynamics of water innovation in African cities.[103]

Engaging with programmes, such Imagine H_2O, can help develop ecosystems for water innovation and entrepreneurship in the Arab region and transform start-ups into scalable businesses for smarter water resources management solutions.[104]

5.9 Unleashing female and youth potential and reaching gender equality

Regional and global context: mainstreaming gender in IWRM is in line with SDG 5 on gender equality and empowering all women and girls and its specific target 5.5 on ensuring women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. The Symposium on Women and Water Security for Peacebuilding in the Arab Region held in Beirut, in 2018, set the grounds to advance the water security-gender nexus in the Arab region.[105,106,107]

Key recommendations: more than any other region in the world, engaging with the whole of society – especially women and youth – needs to be increased to achieve progress in IWRM implementation in the Arab region. Arab countries need to systematically adopt gender-sensitive approaches in water planning, management and decision-making. This means considering the differences in needs, uses and practices, access to resources and impacts on men and women. The Arab region's average implementation score for the gender-related question is 56, showing that more progress is needed to reach gender equality. While each country in the region has its own specificities and challenges, some common enablers are identified that can help unleash female and youth potential to accelerate IWRM implementation.[108]

- **Promote gender equality in national constitutions and legal frameworks:** the establishment of a national legal framework that integrates the concepts of equality facilitates gender mainstreaming in water laws, policies and strategies. In Bahrain, women are constitutionally declared equal to men and occupy many legislative and judiciary executive positions. They also represent a considerable number of technical and managerial staff in the water-related agencies. In Oman, laws, policies and plans consider non-discrimination between the sexes, whether at the national or municipal level. The strategy and vision of Oman 2040 also emphasize gender equality in rights and duties, which is reflected in water resources management. Women in the United Arab Emirates enjoy the same constitutional rights as men and 50 per cent of the members of the Federal National Council are women. This provides a good basis to enhance gender mainstreaming in all areas of water resources management.
- **Bridge the gap between gender policies or strategies and practice:** the implementation of gender policies and strategies needs to be supported by concrete action plans and earmarked funding for gender mainstreaming in IWRM. In Morocco, the Water Law No. 36-15 provides for the participation of women in water-related decision-making. Women are represented in Hydraulic Basin Councils and it is required that at least a quarter of representatives of civil society working in the water sector be women. Moving forward, the implementation of the 2050 water plans at national and basin levels will also ensure gender equality in terms of water resources management. In Jordan, gender plans exist but implementation and effective involvement of women in water resources management require more human and financial resources. In Yemen, funding needs to be increased to effectively integrate gender into the operational plans for managing water resources at the level of the water basin committees.
- **Measure true progress through monitoring and evaluation:** measuring real progress towards gender equality in IWRM necessitates designing gender-sensitive indicators, collecting gender-disaggregated data and establishing monitoring and evaluation processes. In the State of Palestine, it is recognized that progress needs to be measured through monitoring the effective application of gender parity rules and their influence on IWRM outcomes. It is also recommended to set interim targets where appropriate. In Tunisia, while texts on gender equality exist, there is no disaggregation of data by sex to draw statistics and assess the level of integration of gender equality in public policies. Setting up more indicators on gender is recommended.
- **Build capacity and technical expertise in gender issues:** the need for capacity building in gender issues is recognized as the main driver in several Arab States such as the State of Palestine, the Sudan and Lebanon. In Lebanon, efforts must also target enhancing awareness for gender mainstreaming in water-related institutions. This should include, among others, conducting social analysis to consider attitudes and behaviour patterns related to water management and services with a gender perspective, disaggregating results by sex, and understanding why different stakeholders (female/male, youth) might have different perceptions and attitudes.

Further information, support and inspiration for action

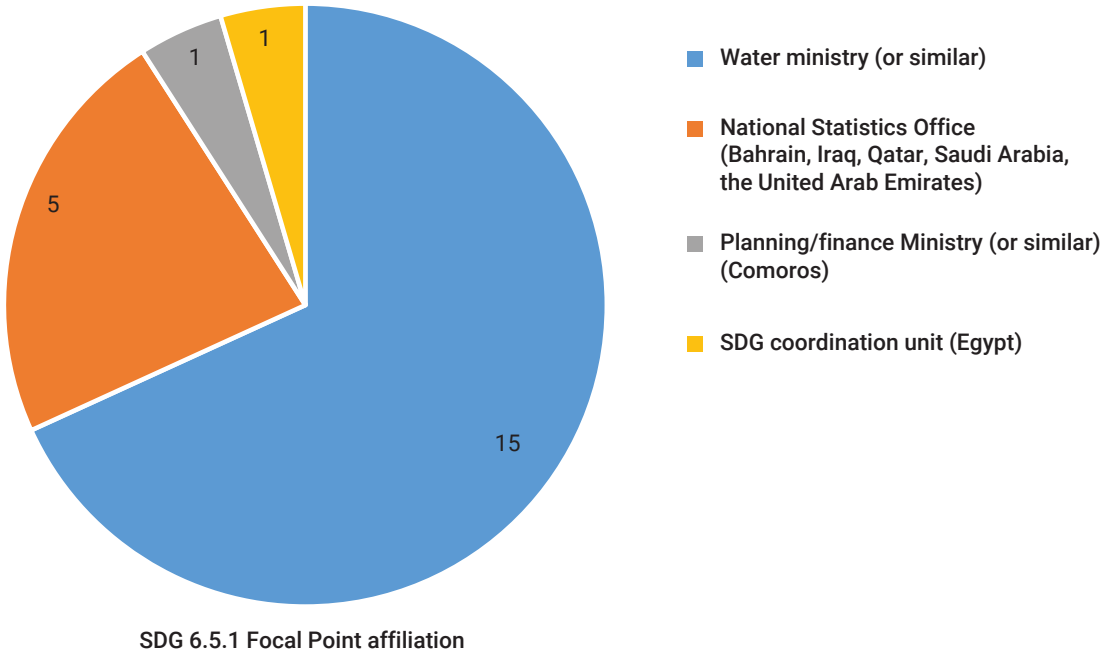
While each country in the Arab region needs to set its own priorities and decide on the best path towards achieving SDG 6.5.1, there are various support options available:

- IWRM Data Portal (http://iwrmdataportal.unepdhi.org): it includes national SDG indicator 6.5.1 reports, visual country summaries, global and regional reports, a results database, methodologies and Help Desk.
- SDG 6 IWRM Support Programme (www.gwp.org/en/sdg6support): it can support countries in facilitating multi-stakeholder dialogues to develop IWRM action plans and provide support to implementing particular aspects of water resources management prioritized through the action plans or elsewhere. It also helps supporting countries to access financing for particular activities, and overcome data and information sharing challenges.
- SDG 6 GAF and Action Space (www.unwater.org/sdg6-action-space): this initiative led by UN-Water aims to coordinate the international community's support to countries to achieve SDG 6. The framework focuses on five accelerators: optimized financing, improved data and information, capacity development, innovation, and governance.
- UN-Water SDG 6 Data Portal (www.sdg6data.org): it provides global data sets on all SDG 6 indicators.
- ESCWA (www.unescwa.org): it provides assistance based on specific national requests for support by member States.
- AWARENET (www.awarenet.org): support is more specifically provided through the AWARENET IWRM focus group.
- Africa Water Investment Programme (www.aipwater.org): it supports countries in developing and accelerating the implementation of gender transformative and climate-resilient water investment programmes and projects at the regional and national levels. It also contributes to continental efforts aimed at achieving universal access to safe water, sanitation, hygiene and integration of water security in COVID-19 economic recovery plans.

Annex 1. Stakeholder consultation process in data collection

The 6.5.1 focal points led the stakeholder consultation processes and most of them were affiliated to water ministries or similar institutions (figure A.1).

Figure A.1. Overview of national focal point affiliations



Note: "Water ministry (or similar)" indicates a ministry with chief responsibility for water resources management, often merged with other areas such as natural resources, the environment, climate change, land, energy, agriculture, fisheries, forestry or mines.

Countries with focal points, which were not affiliated with the water ministry or similar, were less likely to conduct stakeholder consultation processes or even to report at all.

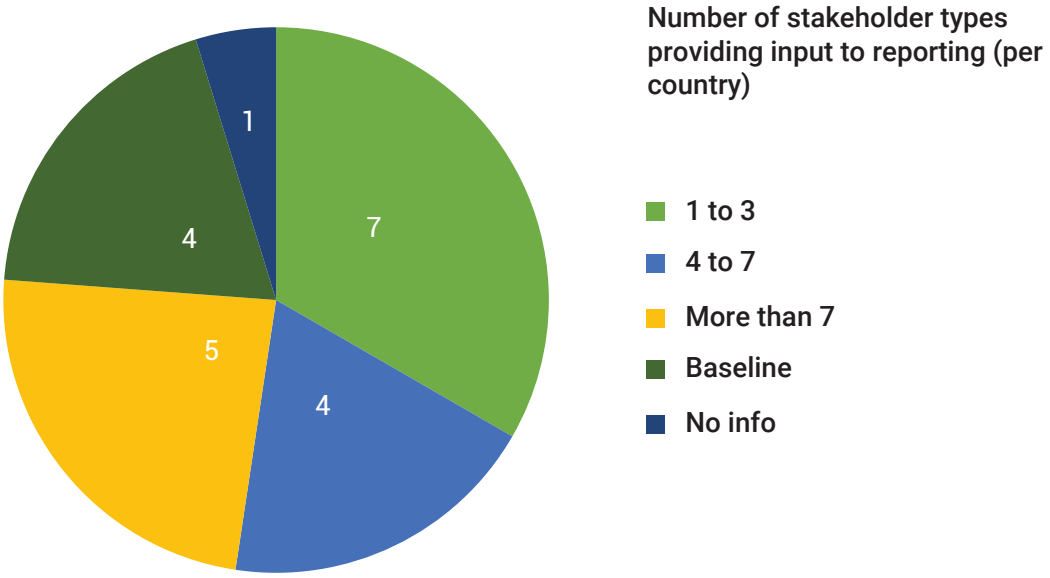
Indeed, three out of the four countries that re-used their baseline submission had focal points affiliated with either the National Statistics Office or an SDG coordination unit.

Recommendation: in subsequent reporting rounds, try to identify 'proxy' focal points within water ministries or similar that can liaise with the official focal points to follow-up on the reporting process.

In annex E of the 6.5.1 survey, countries were asked to provide a brief overview of the stakeholder consultation process, including the types of stakeholders involved and their level of engagement. In general, countries in the Arab region provided relatively little information in annex E.[109] The broad overview of stakeholder consultation processes is shown in figure 1.2 in section 1.4 of this report.

The breadth of stakeholder consultation varied greatly between countries, with seven countries conducting consultations between one and three stakeholder types, and five countries conducting consultations between more than seven stakeholder types (figure A.2).

Figure A.2. Breadth of stakeholder consultation (number of countries per category)

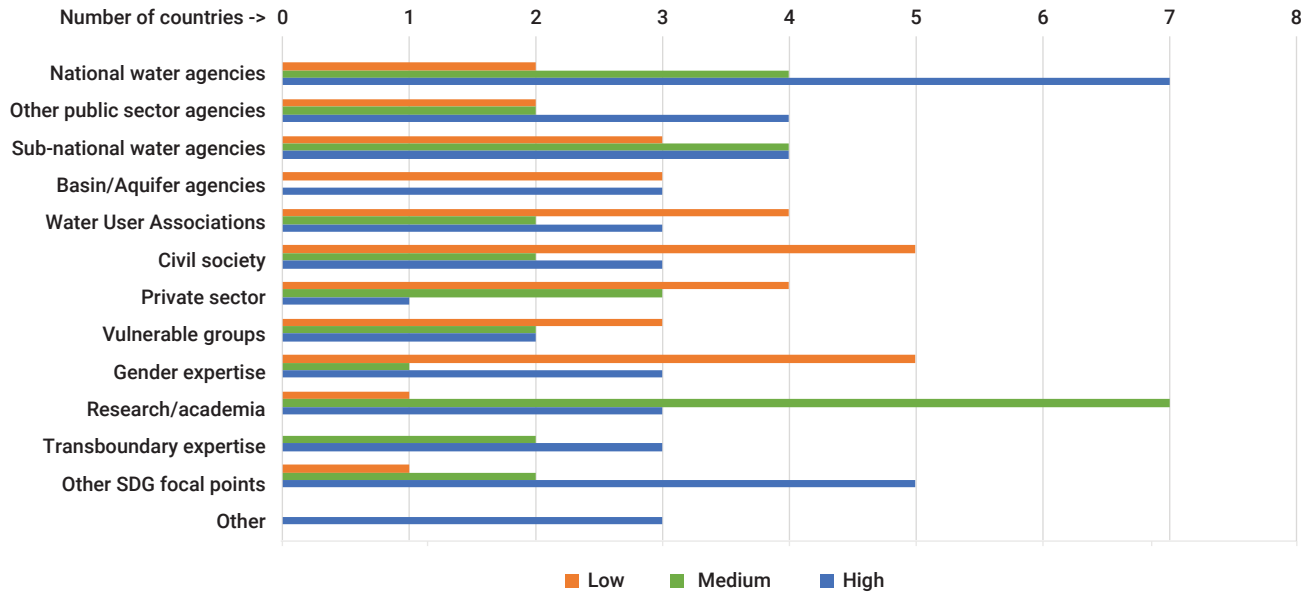


Note: There may be more than one organization represented within each stakeholder group.

Countries were also asked to define the level of engagement from each stakeholder group as low (given opportunity to contribute), medium (some input) or high (discussion/negotiation) (figure A.3). 14 of the 17 countries that submitted revised or new reports in 2020 provided this information. As expected, national water agencies (or similar) represented the stakeholder group with greatest levels of engagement (11 countries reporting at least some input), followed by academia (10 countries).

However, in most countries, there is a need to increase the level of meaningful consultation with other stakeholder groups, including local level actors such as basin/aquifer organizations, water user associations/civil society, vulnerable groups and the private sector. Importantly, as IWRM cuts across multiple sectors, and therefore SDGs, most countries need to increase the involvement of other sectors and other SDG focal points (particularly within SDG 6) in the reporting process.

Figure A.3. Number of countries receiving either "some input" (medium engagement) or having "discussion/ negotiation" (high engagement) with various stakeholder groups, 2020



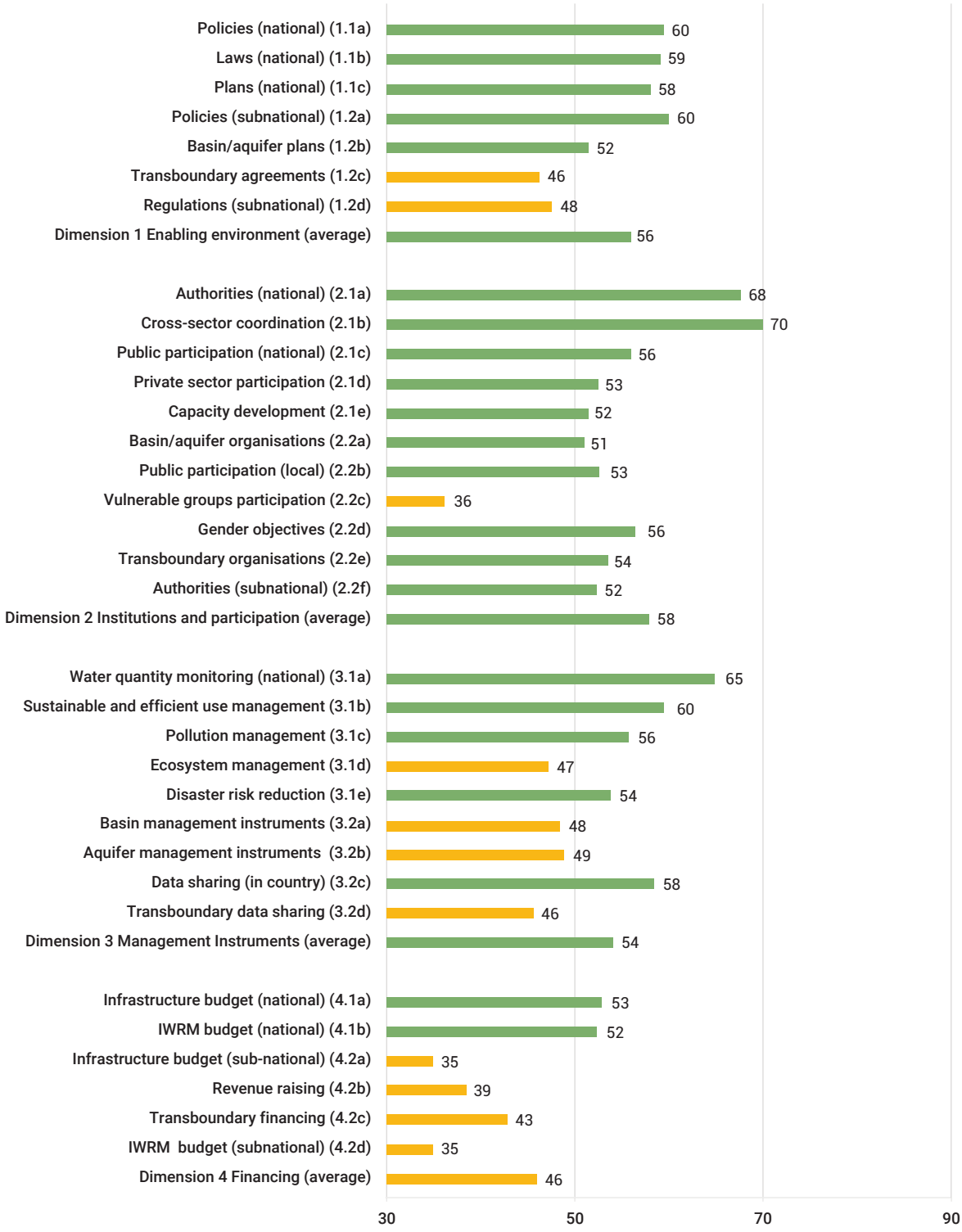
Annex 2. SDG 6.5.1 survey overview

Dimension 1: Enabling environment: policies, laws, plans. Implementation score (0-100)	
1.1	**National level**
a	Water resources policy
b	Water resources law(s)
c	Integrated water resources management (IWRM) plans, or similar
1.2	**Other levels**
a	Subnational water resources policies
b	Basin/aquifer management plans or similar, based on IWRM principles
c	Transboundary agreements
d	Subnational regulations
Dimension 2: Institutions and participation: for water resources management. Implementation score (0-100)	
2.1	**National level**
a	Government authorities
b	Cross-sectoral coordination
c	Public participation in water resources development and management
d	Private sector participation in water resources development and management
e	Capacity development
2.2	**Other levels**
a	Basin-/aquifer-level organizations for leading implementation of IWRM plans or similar
b	Local-level public participation in water resources development and management
c	Participation of vulnerable groups
d	Gender mainstreaming
e	Transboundary organizational frameworks
f	Subnational authorities
Dimension 3: Management instruments: for water resources management. Implementation score (0-100)	
3.1	**National level (includes surface water and/or groundwater, as relevant to the country)**
a	Water availability monitoring
b	Sustainable and efficient water-use management
c	Pollution control
d	Management of water-related ecosystems
e	Water-related disaster risk reduction
3.2	**Other levels**
a	Basin management
b	Aquifer management
c	Data- and information-sharing (within countries)
d	Transboundary data- and information-sharing
Dimension 4: Financing: for water resources development and management. Implementation score (0-100)	
4.1	**National level**
a	National budget for water resources infrastructure (investments and ongoing costs)
b	National budget for water resources management (investments and ongoing costs)
4.2	**Other levels**
a	Subnational/basin budgets for water resources infrastructure (investments and ongoing costs)
b	Revenue raising
c	Financing for transboundary cooperation
d	Subnational/basin budgets for water resources management (investments and ongoing costs)

Survey annexes[110]
Annex A: Glossary
Annex B: Transboundary level
Annex C: Barriers, enablers and next steps for furthering IWRM implementation
Annex D: Priority water resource challenges
Annex E: 6.5.1 country reporting process form

Annex 3. Distribution of country implementation of IWRM elements for the Arab region

Annex 4. Average Arab region implementation of IWRM elements



Annex 5. 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

Countries	Final IWRM score	S1	S2	S3	S4
		Average	Average	Average	Average
		Enabling environment	Institutions and participation	Management instruments	Financing
Algeria	54	49	51	57	60
Bahrain	39	28	48	41	40
Comoros	20	37	26	10	7
Egypt	42	47	46	49	24
Iraq	38	33	42	56	20
Jordan	64	70	58	72	57
Kuwait	94	87	100	88	100
Lebanon	25	37	26	24	13
Libya	60	54	67	60	60
Mauritania	47	53	58	33	44
Morocco	71	78	76	66	62
Oman	79	90	81	86	60
State of Palestine	62	83	72	51	40
Qatar	81	60	90	90	85
Saudi Arabia	57	42	69	71	46
Somalia	22	27	19	26	17
Sudan	34	43	35	36	23
Syrian Arab Republic	56	73	62	50	37
Tunisia	60	59	62	58	60
United Arab Emirates	79	69	82	73	93
Yemen	36	50	47	36	12

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This report provides a progress update on implementing IWRM in the Arab region and identifies priority areas that will help accelerate full implementation. It is based on data from 21 out of the 22 countries in the region that reported on SDG indicator 6.5.1 across 2017 and 2020. The analysis of progress towards the 2030 target is based on 15 countries that participated in this survey in 2017 and 2020. The rate of IWRM implementation needs to double to reach SDG target 6.5 by 2030: between 2017 and 2020, the regional average increased similar to the global level increase.

Through analysing the elements of the four fundamental dimensions of IWRM, this report identifies areas of progress, and areas that need urgent attention. The highest implementation level is obtained for institutions and participation, enabling environment and management instruments while the financing dimension is lagging behind. The findings of this report stress the importance of cooperation and experience sharing between and within sub-regions, and will be drawn upon to inform the Water Action Decade's regional preparatory process and reporting, which can mobilize the needed action to achieve internationally agreed goals and targets related to water.

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