





## SDG 6

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**Ensure availability  
and sustainable  
management  
of water and  
sanitation for all**

# A. Introduction


**Water scarcity poses formidable challenges to achieving water security and sustainable development in the Arab region**, with far-reaching implications for food and energy security, economic progress, livelihoods and human health. Given the gravity of the situation, the region’s progress so far on SDG 6 remains insufficient. Access to safe water, sanitation and hygiene (WASH) services is uneven both among and within countries. Furthermore, water-use efficiency has regressed, and freshwater withdrawals have soared to highly unsustainable levels. More efforts are needed to implement integrated water resource management (IWRM), including through transboundary water cooperation. The region’s pursuit of SDG 6 is also challenged by climate change and a lack of adequate financing. Notably, official development assistance directed to sustainable water management has declined, underscoring the urgent need for renewed commitment and investment in WASH-related initiatives.

## What the data say


*Data included in this section are from the ESCWA Arab SDG Monitor, unless otherwise indicated (accessed in December 2023).*



The **proportion of the population with access to safely managed drinking water services** rose from 73 per cent in 2015 to 75 per cent in 2022. The **proportion of the population using safely managed sanitation services** increased from 53 per cent to 60 per cent over the same period. Nevertheless, these modest rates of progress are insufficient to ensure universal access to safely managed WASH services by 2030. Large disparities persist among and within countries, particularly between rural and urban areas.



**Water-use efficiency**, measured as the ratio of value added to the volume of water use, declined from \$10.65 to \$9.65 per cubic metre from 2015 to 2020.



**Freshwater withdrawals** increased from 101 per cent to 120 per cent of available resources from 2015 to 2020. Water stress is higher than in any other region, and six times higher than the global average of 18 per cent.



The average **IWRM implementation score**, assessed on a scale from 0 to 100, increased from 45 in 2017 to 50 in 2020. It remained within the medium-low range, slightly below the global average score of 54.



Only 30 per cent of **transboundary basins** in the region had an operational arrangement for water cooperation in 2020.



The amount of **official development assistance received for water and sanitation** declined by 34 per cent from 2015 to 2021.

The region faces significant shortfalls in data to track progress on SDG 6. Bridging data gaps is crucial for informing policymaking, implementation, and follow-up and review.

For an up-to-date view of SDG 6 data at the national and regional levels and an analysis of data availability, please refer to the [ESCWA Arab SDG Monitor](#).

### The Arab region was the most water-scarce region in the world in 2020:

- 19 States were water scarce, with less than 1,000 cubic metres of renewable water resources per capita per year.
- 13 States experienced absolute water scarcity with less than 500 cubic metres of renewable water resources per capita per year.
- 90 per cent of the Arab population lived in countries experiencing water scarcity.
- 50.8 million people lacked access to basic drinking water services.

Sources: FAO, 2023; WHO and UNICEF, 2023.

## On the road to 2030 – suggested policy approaches to accelerate progress on SDG 6

- **Localize policy approaches to ensure access to safe water and sanitation** by tailoring services to the needs of those in remote areas, refugees, displaced communities and slum dwellers. This includes encouraging the adoption of low-cost, sustainable technologies suitable for local contexts, such as rainwater harvesting and sanitation options that do not require extensive infrastructure.
- **Strengthen IWRM** by creating effective cross-sectoral coordination frameworks involving all groups of water users (agriculture, industry, energy, tourism, etc.) and enhancing transboundary cooperation arrangements.
- **Build partnerships with universities and research centres to bolster science-based analyses and approaches** that make water projects measurable, monitorable and attractive to long-term private investments.
- **Leverage public-private partnerships** to attract private sector financing for WASH infrastructure development and technology transfer.
- **Invest in capacity-building programmes to design water projects** that demonstrate a solid climate rationale and can attract grants and concessional financing, especially in least developed and conflict-affected countries.
- **Adopt and localize desalination technologies when more efficient alternatives are not available**, while prioritizing renewable energy sources and mitigating potential environmental impacts, including brine discharge, air pollution and greenhouse gas emissions.
- **Promote water-use efficiency policies**, such as precision irrigation, water-efficient cropping systems and enhanced water metering, while adopting an intersectoral approach to decouple economic growth from water use.
- **Regulate water overconsumption and transition from blanket water subsidies to targeted subsidies for those in need.**
- **Promote managed aquifer recharging** to alleviate water scarcity and improve water security. For instance, this could entail using surplus surface water, desalinated water, treated wastewater or harvested rainwater.



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## B. The policy landscape for SDG 6

The policy landscape in the Arab region does not adequately respond to the challenges posed by water scarcity and climate change. Many policies are outdated and ineffective, and there is a lack of coordination among sectors and countries. Many States make insufficient investments in WASH infrastructure and management. Pressing priorities to improve the policy landscape include mainstreaming IWRM by reforming institutional structures to achieve coordinated and cohesive national water policies and actionable legislation; developing local capacities; strengthening WASH financing; and establishing water as a core component of climate change adaptation and natural disaster risk reduction.

**Progress on SDG 6 is closely linked to sustainable agricultural production (SDG 2), energy access (SDG 7), climate change adaptation (SDG 13), and peace, security and displacement (SDG 16). Coherent policies to achieve SDG 6 must incorporate the water-energy-food-ecosystem nexus and seek integrated solutions that align priorities across all SDGs.**

Policy approaches to achieving SDG 6 vary among the Arab States, reflecting their unique national contexts and available resources. Several common trends emerge across countries, however, regardless of geographic location or income level.

◆ **Most Arab States have acknowledged water and sanitation as human rights at the regional and global levels, but only some have explicitly recognized these rights in their legal frameworks.** As at April 2023, 18 States<sup>1</sup> had ratified the Arab Charter on Human Rights, which includes the provision of safe drinking water and proper sanitation systems among the measures States should take to ensure rights to an adequate standard of living and a healthy environment. Twenty Arab States<sup>2</sup> voted in favour of the United Nations General Assembly resolution [64/292](#) on the human right to water and sanitation in 2010. Yet only four countries – **Egypt, Morocco, Somalia and Tunisia** – have explicitly recognized the rights to water, sanitation or both in their constitutions. At least five other countries – **Algeria, the Comoros, Lebanon, Mauritania and the State of Palestine** – have explicitly recognized these rights elsewhere in their legislations.

Legal recognition is not sufficient for the effective enjoyment of the rights to water and sanitation. Regulations, funding and concrete actions are also required.

A mere connection to the water network is also not sufficient to fulfil the right to water. The water supply must be safe, affordable and regular enough to meet essential needs, such as for drinking, personal hygiene and food preparation.

◆ **Access to safe drinking water has been integrated into the policies of most Arab countries. Yet measures tailored to the specific needs of vulnerable populations remain less common.** Among 19 countries surveyed,<sup>3</sup> all had adopted policies or plans to ensure access to safely managed drinking water, although some are now outdated and require updating to factor in water scarcity and climate change risks. Most countries (18 out of 20)<sup>4</sup> have established national drinking water quality standards, which water utilities, government agencies and other stakeholders use to monitor and manage the quality of drinking water. Several countries<sup>5</sup> (12 out of 18) have incorporated water safety plans or equivalent risk management approaches into their policies or regulations. For example, the Updated National Water Sector Strategy (2020) of **Lebanon** includes a water safety plan manual, and the Electricity and Water Authority in **Bahrain** has a contingency and disaster plan.

Policies and standards often overlook the ability of local laboratories to conduct water quality tests and analyse results, with insufficient attention given to bolstering local technical capacities and facilitating access to essential equipment and technologies.



Despite numerous policies, plans and standards, 113 million people – or a quarter of the region's population, mostly in least developed or conflict-affected countries – lacked access to safely managed drinking water services in 2022. Limited progress since 2015 stems from various factors, including governance issues, capacity limitations, technology and funding constraints, occupation, conflict and inadequate attention to vulnerable groups, particularly in rural areas. While many countries report having policies with measures to enhance the provision of safely managed water services to vulnerable populations (see section D), these instruments frequently apply broadly to all citizens and do not sufficiently address the unique challenges of inhabitants of rural and remote areas, persons living in poverty, refugees or internally displaced persons IDPs, among others. Exceptions include the Poverty Alleviation Strategy of **Iraq**, the National Resilience Plan (2014–2016) and the Response Plan for the Syrian Crisis (2016–2018) of **Jordan**, and the National Strategy for the Development of Rural and Mountainous Areas of **Morocco**.

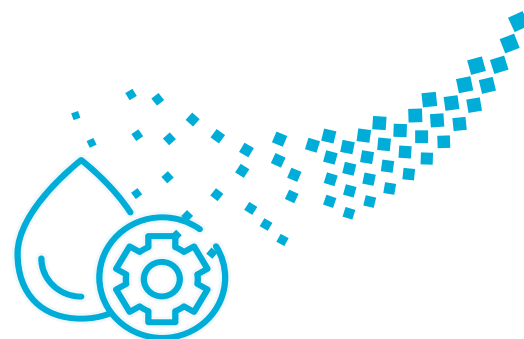
- ◆ The Drinking Water Safety Strategic Framework (2017) adopted by the **Sudan** aims to ensure that everyone has sustainable access to safe drinking water, helping to uphold the human right to water and a range of other human rights. The framework has four strategic objectives: to protect water sources from pollution and ensure they are sustainably managed; to design and build water supply systems that are resilient to climate change and other challenges; to strengthen management processes to ensure water supply systems are properly operated and maintained; and to strengthen monitoring and surveillance systems so that drinking water is consistently safe. The framework was developed through a consultative process involving the Government, stakeholders and development partners, and is aligned with international standards and best practices.
- ◆ The **Jordanian** Standard No. 286 (2015), published by the Jordan Standards and Metrology Organization, specifies requirements for the quality of drinking water. It covers a wide range of parameters, including microbiological, physical and chemical, and specifies sampling and testing methods to guarantee compliance. The standard is aligned with international standards, such as the World Health Organization (WHO) Guidelines for Drinking-water Quality, and is used by water utilities, government agencies and other stakeholders to monitor and manage the quality of drinking water. Notably, the standard requires water utilities to provide consumers with information about the quality of their drinking water.

◆ **Most countries have adopted policies on safely managed sanitation services but have not done enough to ensure equitable access in rural and urban areas.** Among the 16 surveyed countries,<sup>6</sup> all had national policies covering both urban and rural sanitation. While a majority<sup>7</sup> (15 out of 17) have wastewater treatment standards, fewer countries<sup>8</sup> (11 out of 16) have standards for faecal sludge management. Only 3 out of 15 countries – **Egypt, Oman and Tunisia** – have adopted sanitation safety plans for local risk assessment and management, significantly less than the 12 countries with safety plans for drinking water services.

As is the case in other regions, the status of safely managed sanitation is more precarious than that of drinking water. Many challenges are similar although sanitation typically receives less policy focus compared to water. In some least developed and middle-income countries, treated wastewater



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fails to meet national quality standards due to institutional weaknesses, a scarcity of skilled personnel, high costs, and deficiencies in both collection networks and treatment plants.

- ◆ The Sanitation Code (2012) of **Tunisia** is a stand-out example of a comprehensive and advanced sanitation code. It covers the planning, design, construction, operation and maintenance of sanitation systems, along with the financing of sanitation services and the monitoring and enforcement of sanitation regulations. It also delineates the roles and responsibilities of various stakeholders. Since its adoption, **Tunisia** has made significant strides in sanitation access, with the proportion of the population with access to safely managed sanitation rising from 69.5 per cent in 2012 to 81 per cent in 2022. Rural and urban disparities have narrowed, closing the access gap from 43.5 percentage points in 2012 to 26 percentage points in 2022.

◆ **Most countries have adopted policies to ensure the affordability of WASH services. In parallel, to address overconsumption and enhance the financial sustainability of utilities, some countries are pursuing reforms to restructure tariffs and improve cost recovery.** Contrary to conventional wisdom, most people connected to piped networks in the region are billed for services. As of mid-2015, at least 15 countries<sup>9</sup> used volumetric tariff rates for drinking water. In addition, two countries – **Lebanon** and the **Sudan** – applied flat tariffs. For sanitation, 13 countries<sup>10</sup> had volumetric tariff rates, 3 (**Lebanon**, the **State of Palestine** and the **Sudan**) had flat tariffs and 2 (**Qatar** and **Saudi Arabia**) offered free services. Since then, Saudi Arabia has introduced a tariff for wastewater treatment and Qatar has started charging a fee for non-Qatari residents and establishments.

Most Arab countries<sup>11</sup> (16 out of 17) have introduced policies to guarantee the affordability of WASH services. For example, in **Tunisia**, the drinking water tariff structure is designed around cost escalation segments, providing a lower tariff for volumes below the minimum threshold required for human consumption. Most countries subsidize WASH services, with tariffs typically not covering operations and basic maintenance costs. Among 15 countries,<sup>12</sup> only 5 – the **Comoros**, **Mauritania**, **Morocco**, **Tunisia** and **Yemen** – reported recovering more than 50 per cent of the costs associated with supplying drinking water in urban areas, with lower levels of cost recovery in rural areas and for sanitation services. In recent years, some countries have adjusted pricing mechanisms to create economic incentives for the rationalization of water consumption. For example, most Gulf Cooperation Council countries have reduced subsidies and progressively aligned WASH tariffs with the principle of cost recovery.

- ◆ In 2015, **Saudi Arabia** implemented a revised water tariff structure, a first step towards gradually removing subsidies and meeting the goal of Saudi Vision 2030 of achieving full cost recovery. Under the new tariff structure, the price for monthly volumes under 15 cubic metres remained unchanged while tariffs for higher volumes increased significantly. For instance, the price for 50 cubic metres of water rose 16 times, from \$1.35 to \$21.79, while for 100 cubic metres, it climbed 29 times, from \$3.35 to \$96.46. The tariff reform also introduced wastewater and metre fees for the first time, leading to a further increase in the combined monthly bill for WASH services. The new tariff was designed to enhance cost recovery to 30 per cent of the estimated



Under-pricing water hinders efficiency in use, promotes overconsumption, threatens the financial sustainability of water utilities and strains State budgets. To tackle these challenges, countries should regulate water consumption via proper demand side management, and further the transition from blanket subsidies to smart subsidies that target low-income households.

Blanket subsidies often result in disproportionate benefits for wealthier households due to their higher consumption of water and use of sanitation services. Reducing such subsidies has the potential to yield substantial savings within State budgets, which can be reallocated to targeted subsidies that support disadvantaged populations.



marginal cost of water, up from an estimated pre-reform level of 7 per cent. Due to significant public backlash against the new system, the Government decided to suspend further tariff hikes required to meet 100 per cent cost recovery.

◆ **Freshwater resources remain a key component of national efforts to achieve water security, with policies focusing on developing and managing supplies and protecting resources.** An increasing number of countries are prioritizing resource conservation and preservation. For example, the constitutions of **Algeria** (2016) and **Tunisia** (2022) have codified the safeguarding of water resources for future generations. Several countries, including **Algeria, Bahrain, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, the Syrian Arab Republic, Tunisia, the United Arab Emirates** and **Yemen**, have regulations to curtail extraction, such as quotas, volumetric pricing, drilling licenses and protection zones. For example, **Bahrain** ceased groundwater withdrawal in 2016, designating it as an emergency reserve. Some countries have embraced advanced technologies, such as remote sensing, for enhanced water monitoring and management. For instance, **Jordan** employs remote sensing to track well development, estimate water use and detect illegal abstraction, while **Bahrain** uses the Internet of things to automate irrigation systems. Some countries have taken steps towards decentralization and local governance, as is the case for aquifer contracts in **Morocco**, local agricultural development groups in **Tunisia**, and local water corporations and autonomous utilities in **Yemen**.

◆ **Non-conventional water resources, particularly desalinated water and treated wastewater, play a pivotal role in the water policies and plans of Gulf Cooperation Council countries and are gaining significance in other countries.** An increasing number of countries are incorporating desalination into their water strategies. Since the 1970s, Gulf Cooperation Council countries have placed a strong emphasis on large-scale projects, advanced technologies and regulatory frameworks to ensure water quality and safety. More recently, some middle-income and least developed countries have also adopted water desalination policy frameworks, although typically at a different scale and level of investment compared to the Gulf Cooperation Council countries. As of 2020, a total of 133 water desalination plants were operational or under construction in **Algeria, Djibouti, Egypt, Jordan, Morocco** and **Tunisia**.<sup>13</sup>

The region has witnessed a significant surge in the use of treated wastewater. The number of related projects quadrupled from 97 in 2000 to 409 in 2020.<sup>14</sup> Most countries<sup>15</sup> (14 out of 18) have adopted policies or plans targeting the safe use of treated wastewater. Most countries<sup>16</sup> (15 out of 20) have also adopted standards for the safe use of treated wastewater. At least seven countries – **Egypt, Jordan, Kuwait, Oman, Saudi Arabia, the State of Palestine** and **Tunisia** – and the emirates of Abu Dhabi and Dubai (**United Arab Emirates**) have established stringent microbial limits for reclaimed water used in food crop irrigation, surpassing 1989 WHO guidelines. Some countries, including **Egypt, Jordan, Kuwait, the State of Palestine, the Syrian Arab Republic** and **Tunisia**, have prohibited the use of treated wastewater for irrigating some types of vegetables.



Policies promoting green energy solutions may inadvertently worsen groundwater stress. Regulations and monitoring of pumping technologies and solar energy use in irrigation can help avoid groundwater over-abstraction. Strict enforcement of such regulations is crucial, along with measures to prevent the drilling of illegal wells.

Managed aquifer recharge is a promising approach to alleviating water scarcity and improving water security. This could be done by using surplus surface water, desalinated water, treated wastewater or harvested rainwater.

Water desalination entails large energy requirements and can be associated with adverse environmental impacts. Policies should prioritize energy efficiency and mitigate brine discharge, air pollution and greenhouse gas emissions.

Desalination should be coupled with efforts to localize technology and mitigate environmental externalities. Addressing the feasibility of these technologies is also crucial, along with securing enablers for them to operate.

Improperly treated wastewater can pollute water sources, contaminate soils and pose health hazards for both workers and consumers. Policies should address these risks and prioritize water quality enhancement.



Rainwater harvesting is identified as a promising adaptation technology in the policies and plans of several countries, including **Bahrain, Iraq, Jordan, Lebanon, Saudi Arabia, Somalia, the State of Palestine, Tunisia and Yemen.**

Maximizing the potential of non-conventional water resources urgently requires policies to localize technologies and the production of needed materials, such as desalination membranes. In some countries, policies are also needed to bolster local capacities to construct and operate desalination, wastewater treatment and rainwater harvesting systems. This process should include creating job opportunities, especially for youth, and leveraging renewable energy sources. Policy choices should consider climate conditions, including the hot and arid climate prevalent in the region, particularly when evaluating aerobic and anaerobic treatment options for wastewater. Concerted efforts are required to raise awareness among farmers and the general public on the safety of treated wastewater use, and to address cultural objections and distrust that have inhibited reclaimed water use.

For more on renewable energy policies see the chapter on SDG 7.

- ◆ The Water Substitution and Reuse Policy (2016) of **Jordan** seeks to direct the water sector towards more efficiency by promoting the use of treated wastewater in irrigation and other economic activities, thus freeing fresh water for municipal uses. The policy calls for expanding wastewater collection and treatment, updating quality standards, promoting decentralized treatment systems for smaller locations, and targeting awareness and educational programmes to farmers.
- ◆ The Water Conservation Strategy (2010) of the **United Arab Emirates** calls for the efficient management and better use of desalinated water and treated wastewater, including by applying economic optimization principles to the design of future desalination plants, further developing aquifer storage and recovery by using surplus desalinated water, coordinating measures to increase the use of treated wastewater and conducting awareness-raising campaigns to overcome public concerns. In addition, the UAE Water Security Strategy 2036 (2017) calls for expanding the use of treated wastewater by 95 per cent by 2050.

◆ **Water-use efficiency and conservation measures are increasingly included in water policies and plans across the region, with a notable emphasis on the agricultural sector.** Recognizing the critical role of agriculture, which accounts for over 80 per cent of freshwater withdrawals in the region,<sup>17</sup> and guided by a water-energy-food-ecosystem nexus perspective, most countries have embraced policies to enhance water-use efficiency in this sector. These policies include the promotion of precision irrigation (implemented in most countries<sup>18</sup>), the adoption



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Water-use efficiency policies alone are not sufficient to decrease water use in agriculture. Farmers may use saved water to irrigate additional land or extend crop cycles. An intersectoral approach is needed to decouple economic growth from water use while integrating improved productivity into a holistic vision for national food systems.

Consistent well metering often faces technical deficiencies, tampering and vandalism. Policies should enhance enforcement capacities and increase buy-in from stakeholders.



of water-efficient cropping systems (prevalent in several countries<sup>19</sup>) and the enhancement of water metering (evident in some countries<sup>20</sup>). Some countries have also sought to limit the volume of water used in agriculture. For example, the Water Reallocation Policy adopted by **Jordan** caps irrigation water volumes and redistributes water to municipal water use and other sectors, while the National Transformation Programme of **Saudi Arabia** seeks to reduce the percentage of water used in agriculture relative to total available water resources.

Some countries have provided financial incentives to encourage farmers to adopt water-efficient measures. For instance, the National Programme for Irrigation Water Saving of **Morocco** has subsidized the switch to localized irrigation systems, while in the **United Arab Emirates**, the emirate of Abu Dhabi has extended financial support to farmers who restrict water-intensive fodder production.

Many countries have implemented policies and programmes to promote water conservation, ranging from awareness campaigns on responsible water use (such as *Tarsheed* programme in **Qatar** and *Qatrah* programme in **Saudi Arabia**) to penalties for improper water use or wastage (exemplified by the Conservation Law No. 20/2015 of **Qatar**, which prohibits the use of potable water for washing cars or cleaning yards) and the criminalization of water theft (as in the National Water Strategy of **Jordan**). Initiatives to reduce losses in distribution networks, including through detecting leaks, optimizing pressure and replacing pipes, are prevalent in some countries, such as **Bahrain, Djibouti** and **Jordan**.

For more on water use policies in the agricultural sector, see the chapter on SDG 2.

- ◆ **Bahrain** has made significant strides in reducing its water stress level from 249 per cent of renewable freshwater resources in 2000 to 134 per cent in 2020. This improvement can be attributed to several key factors, including increased use of desalinated water and treated wastewater resources, the adoption of more efficient irrigation technologies, the implementation of smart metering and a shift towards less water-intensive sectors. While the water stress level in 2020 remained above the regional average of 120 per cent and was significantly higher than the global average of 18 per cent, the country stands out for achieving the most rapid reduction in water stress in the region in the last two decades. It is one of only five Arab countries to have successfully lowered its water stress levels since 2000.

◆ **Some progress has been made in the adoption of policies to promote IWRM. Further measures are needed to build capacity, bolster institutions and increase investment.** IWRM improved in most Arab countries between 2017 and 2020. **Oman** stands out for more than doubling IWRM implementation in this period, demonstrating that substantial and rapid progress can be achieved.<sup>21</sup> In most countries, IWRM policies, laws or plans are in place at the national level but more efforts are needed to transfer capacity and knowledge to local levels.<sup>22</sup> Some countries have created cross-sectoral coordination frameworks, such as the National Agency for Integrated Water Resources Management in **Algeria** and the High Council for Water and Climate in **Morocco**.



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IWRM implementation in the region does not sufficiently address the participation of vulnerable groups, monitoring and evaluation, or transboundary cooperative arrangements.

To reach [SDG target 6.5](#), on IWRM, by 2030, the region needs to double the implementation rate. Enhanced financial resource mobilization requires particular attention given very limited progress to date.<sup>23</sup>

- ◆ The National Environmental Strategy and Action Plan for **Iraq** (2013–2017) calls for the negotiation of agreements governing riparian rights, the exchange of operational and hydraulic information and the implementation of joint hydraulic projects with neighbouring countries.

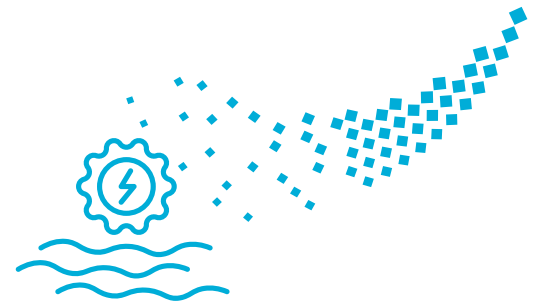
◆ **While all Arab countries mention climate change in their water policies or strategies, more specific and concrete adaptation measures are needed.** Water adaptation measures have been prioritized in the nationally determined contributions of 20 Arab countries and further detailed in the national adaptation plans of 3 countries (**Kuwait**, the **State of Palestine** and the **Sudan**). Additionally, 12 out of 16 Arab countries<sup>24</sup> have integrated climate change preparedness for WASH into their national planning, covering mitigation, adaptation and the resilience of drinking water systems. In their water and climate policies and strategies, however, most countries only partially address water scarcity and climate risks to water. **Jordan**, the **State of Palestine** and **Tunisia** are notable exceptions, having developed policy instruments that comprehensively address these critical challenges.

Countries are increasingly adopting a water-energy-food-ecosystem nexus approach to their water policies, sometimes as part of strategies to address climate change. Some, such as **Djibouti**, **Egypt**, **Iraq**, **Jordan**, **Morocco** and the **Gulf Cooperation Council countries**, are integrating renewable energy into water production and wastewater treatment to reduce costs and greenhouse gas emissions. For example, the *As-Samra* (**Jordan**) and *Gabal El Asfar* (**Egypt**) wastewater treatment plants use cogeneration systems powered by anaerobic sludge digestors. Most countries prioritize water-saving practices in agriculture to address water scarcity and adapt to the impacts of climate change, while some have also adopted policies for disaster risk reduction in water-related events. Conversely, many countries lack functional early warning systems for addressing water scarcity and water-related climate change risks.

To enhance their resilience to climate change, Arab countries should adopt science-based approaches to better comprehend the impacts on water availability and adopt corrective measures accordingly. This would include incorporating climate change vulnerability and risk assessments into national water policies, along with related adaptation planning exercises. Science-based assessments can provide evidence and justifications for integrating water and sanitation into climate-related plans and policies.

For more on adaptation measures and disaster risk reduction, see the chapter on [SDG 13](#).

- ◆ The National Water Strategy (2023–2040) of **Jordan** underscores the water-energy-food-ecosystem nexus with well-defined targets and objectives. It advocates the integration of renewable energy in the water sector and enhanced synergy between water and agriculture activities, with a focus on optimizing the productivity of irrigation water.
- ◆ The National Water Policy for **Palestine** intends to develop flexible strategies to address climate change impacts on water resources, limit the water sector's carbon footprint and reduce the water footprint through the most efficient use.



Water and disaster risk reduction policies in the region have not sufficiently addressed early warning systems related to water. There is an urgent need for such systems for groundwater and surface water levels, as well as for water quality, including saline intrusion.



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## C. Policy trends by subregion

The overarching trends aforementioned are particularly evident in Arab middle-income countries. Subregional trends are more pronounced in the least developed, Gulf Cooperation Council and conflict-affected countries.

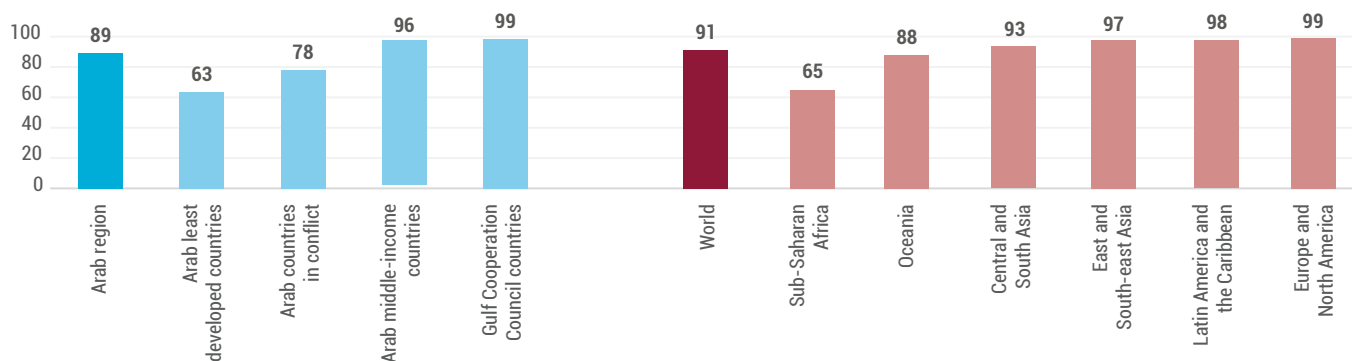
### 1. Arab least developed countries

The Arab least developed countries grapple with a number of additional challenges in water and sanitation. Their rates of access to drinking water and sanitation services are the lowest in the region and among the lowest globally (figures 6.1 and 6.2),<sup>25</sup> especially in rural areas. In 2020, 25 per cent of the rural population resorted to open defecation in the least developed countries, compared to less than 0.5 per cent in middle-income countries and none in Gulf Cooperation Council countries.<sup>26</sup>

Significant progress has been achieved in recent years, however; the proportion of the population practising open defecation was 35 per cent in 2015.

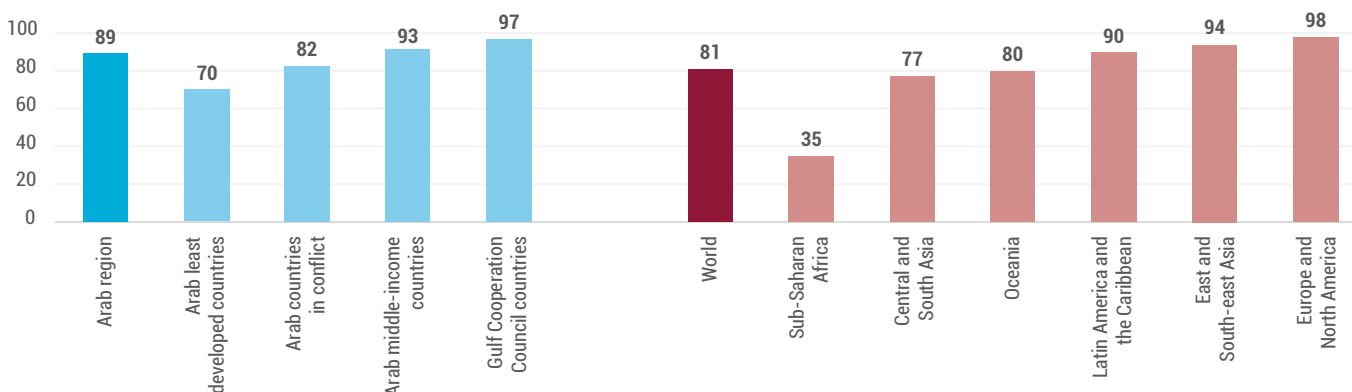
Least developed countries confront the highest vulnerability to climate change in the region, compounding their water-related concerns. They also have the lowest rate of IWRM implementation, although **Mauritania** is an exception. This confluence of challenges underscores the urgent need for targeted and sustainable interventions to address pressing water and sanitation issues comprehensively.

**Figure 6.1**  
Proportion of the population using basic drinking water services, 2022 (Percentage)



Source: ESCWA, 2023b.

**Figure 6.2**  
Proportion of the population using basic sanitation services, 2022 (Percentage)



Source: ESCWA, 2023b.

◆ **Arab least developed countries are making significant strides to eradicate open defecation**, prioritizing behaviour modification initiatives, communal toilet construction and targeted assistance for vulnerable populations. Five out of six countries – **Djibouti, Mauritania, Somalia, the Sudan and Yemen** – have policies or plans to tackle open defecation. The **Comoros** stands out for its remarkably low incidence of the practice.<sup>27</sup>

- ◆ WASH Sector Strategic Plan (2019–2023) of **Somalia** prioritizes a number of goals for improving sanitation, including ending open defecation. It seeks to increase the number of villages free of open defecation from a baseline of 144 in 2018 to 4,068 in 2023. Moreover, it establishes a target to raise the percentage of people living in environments free from open defecation to 70 per cent by 2023.
- ◆ The National Roadmap to End Open Defecation in the **Sudan** outlines a comprehensive approach including sanitation marketing, tailored toilet designs, community certification, innovative financing and enhanced coordination mechanisms.

◆ **Arab least developed countries are increasingly enacting policies that promote the integration of traditional knowledge and practices as well as modern approaches for sustainable water management in livestock production.** The livestock sector is very important to the economies of most least developed countries, providing food, income and employment for millions of people. The sector is also a major user of water and highly vulnerable to climate change. As a result, water policies for sustainable livestock production focus on water access and conservation, climate change adaptation and sustainable grazing practices.

- ◆ The National Adaptation Plan of the **Sudan** outlines various adaptation measures related to water and rangelands, including enhanced water harvesting techniques, the rehabilitation of *hafirs* and dams, support for irrigated fodder crops and encouragement of the use of smaller livestock breeds adapted to drought conditions.
- ◆ The National Strategy for Sustainable Access to Water and Sanitation of **Mauritania** intends to improve access to water for livestock by carrying out an inventory of existing pastoral water points and creating 600 new ones by 2030.

◆ **Regulations and standards for the sanitation chain remain limited.** Among five surveyed least developed countries, three (the **Comoros, the Sudan and Yemen**) have policy instruments on wastewater treatment. Notably, **Yemen** is the only one among them with policies or plans

for the safe use of treated wastewater. Only **Somalia** among these countries has enacted regulations, standards or guidelines addressing faecal sludge treatment.<sup>28</sup>

◆ **Improved access to finance is needed.** Policies, strategies and plans do not sufficiently integrate funding considerations. The six least developed countries received only 6.5 per cent of all climate finance for the water sector channelled to the Arab region from 2010 to 2021.<sup>29</sup> Capacity-building and other forms of support could help develop bankable projects to facilitate access to finance. More grant finance is needed as many countries are heavily indebted and cannot afford more loans. Capital-intensive projects, such as the development of non-conventional water resources, remain unaffordable for most. For **Yemen** to address its current water deficit through desalination – which is not the only solution available and may not be sustainable in the long term – it would require 50 large desalination plants with an estimated total operating cost equivalent to 10 per cent of GDP.<sup>30</sup> Enhancing local capacities to access additional finance for nature-based local solutions may be financially more viable.

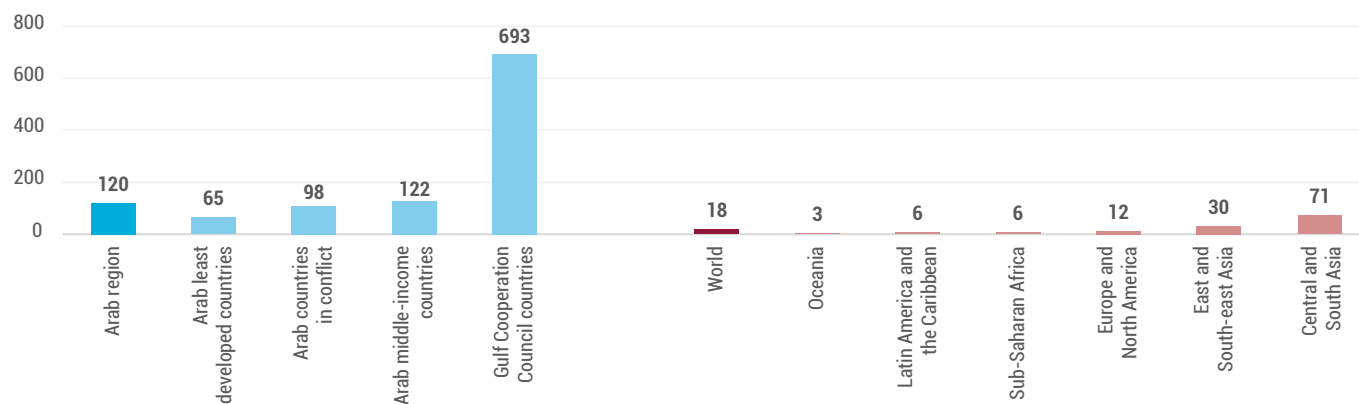
- ◆ **Djibouti** has secured funding for desalination and wastewater plants from a variety of sources, comprising the State budget, development partners and private investment, including through public-private partnerships. This has allowed the Government to invest heavily in the water sector and increase supplies. For example, the *Doraleh* desalination plant is operated by a private company under a public-private agreement. In 2021, the Government secured a €79 million loan from the European Investment Bank to finance the expansion of the plant and the construction of three new wastewater desalination plants. One challenge with raising funds for desalination projects is their high energy requirement, which can be expensive. To address this concern, Djibouti is developing renewable energy sources to power its plants.

## 2. Gulf Cooperation Council countries

Gulf Cooperation Council countries boast the broadest coverage of safely managed water and sanitation services in the region.<sup>31</sup> Yet they grapple with the world's highest levels of water stress and groundwater abstraction. Significant challenges encompass the energy-intensive nature of desalination plants, disparities between wastewater treatment and reuse, and limited value derived from imported technologies. A substantial portion of water used in Gulf Cooperation Council countries comes from non-conventional sources.

**Figure 6.3**

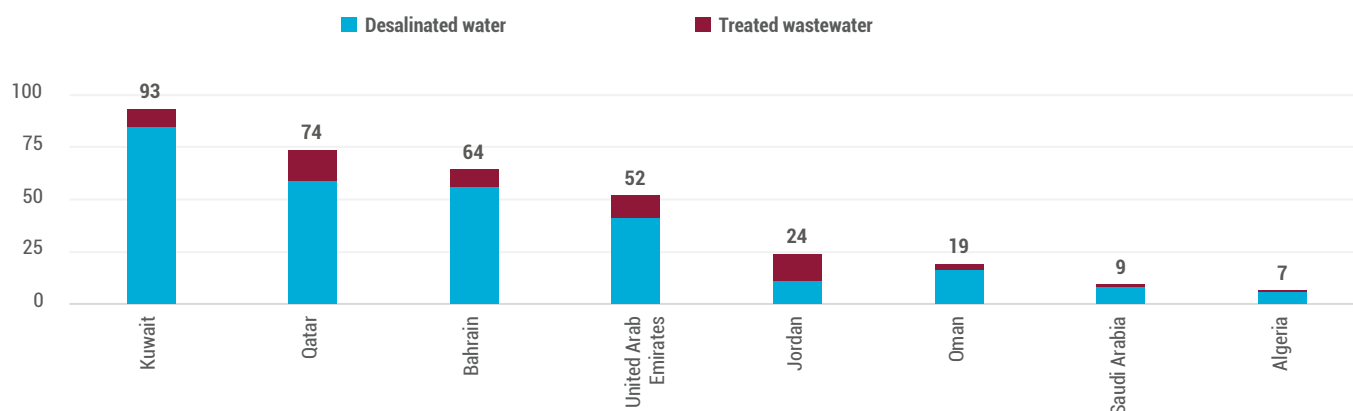
Freshwater withdrawal as a proportion of available freshwater resources, 2020 (Percentage)



Source: ESCWA, 2023b.

**Figure 6.4**

Desalinated water and treated wastewater as a proportion of total water use, 2020 (Percentage)



Sources: FAO, 2023; Kuwait, Central Statistical Bureau, 2021.

#### ◆ Developing local technologies and manufacturing capacities for water desalination and wastewater treatment.

Gulf Cooperation Council countries are investing heavily in this area to reduce reliance on imported water and wastewater treatment technologies, and to create jobs and economic opportunities.

- ◆ In **Saudi Arabia**, the National Transformation Programme budgeted 300 million Saudi riyals for the localization and transfer of water technology between 2016 and 2021, and 1.2 billion Saudi riyals to localize needed renewable energy technologies to support the local power and water desalination sectors. One initiative is to build a production centre for manufacturing and light industries to fulfil plans for establishing water plants.

- ◆ In the **United Arab Emirates**, the UAE Water Security Strategy 2036 includes initiatives to promote local technologies and manufacturing capacities for water desalination and wastewater treatment. It calls for establishing a research and development centre for water desalination and wastewater treatment technologies, for example. The Government has already set the strategy in motion by creating the Masdar Institute of Science and Technology, which is dedicated to sustainable technologies, including water desalination and wastewater treatment. The government-run Emirates Water and Electricity Company has also initiated various programmes to promote local technologies and manufacturing capabilities.

◆ **Diversifying energy sources for water production**, including through the use of renewable energy sources. Gulf Cooperation Council countries are investing in renewable energy and improving the efficiency of water desalination plants to reduce reliance on fossil fuels and improve water security. They are developing new water desalination technologies that are more energy-efficient and cost-effective, which will help to make water desalination more sustainable and affordable.

◆ **Minimizing water supply costs** and increasing cost recovery without sacrificing service quality. Gulf Cooperation Council countries are implementing tiered water pricing, reducing water losses from distribution networks, improving public awareness of water conservation measures, and investing in water recycling and reuse technologies.

◆ In **Saudi Arabia**, a revised water tariff structure was introduced in 2015 as a first step towards meeting the goal of full cost recovery stipulated in the Saudi Vision 2030 (see section B for more information). Additionally, the National Transformation Programme has sought to decrease water loss from 25 to 15 per cent by 2020, including by reducing leakage through monitoring the water pipeline system. It also plans to cut the average time to fulfil a water service connection from 68 to 30 business days, and to boost digital content to improve customer service.

◆ **Increasing the economic use of treated wastewater.** Gulf Cooperation Council countries have developed a number of regulations to promote the use of treated wastewater for different purposes, including irrigation, industrial use and groundwater recharge. These regulations include setting standards for the quality of treated wastewater that can be used for different purposes, and developing permitting and inspection procedures. Through public awareness campaigns, school programmes and other initiatives, these countries are educating the public about the safety and reliability of treated wastewater, and the economic and environmental benefits of using it.

◆ In **Kuwait**, Cabinet Resolution No. 12 of 2018 on the Use of Treated Wastewater in Agricultural and Industrial Sectors mandates that all new agricultural and industrial projects use treated wastewater for at least 50 per cent of their water needs. This regulation has driven greater demand for treated wastewater and encouraged businesses to invest in water recycling and reuse technologies. As a result, there has been a remarkable increase in the use of treated wastewater in recent years. In 2010, only 10 per cent of treated

wastewater was put to use; by 2020, this figure had surpassed 50 per cent.

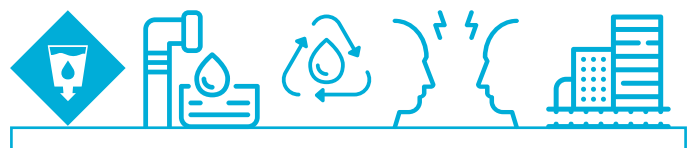
◆ **Enhancing water-use efficiency and conservation** by managing demand and establishing a water-efficient, rational agricultural sector compatible with available water resources. Gulf Cooperation Council countries are implementing water conservation measures in agriculture and industry, reducing water consumption in households, and managing water demand through pricing and regulatory measures to enhance water-use efficiency and conservation.

◆ In **Saudi Arabia**, the National Transformation Programme sought to reduce the municipal water consumption rate per capita from 256 to 200 litres per day by 2020, decrease the volume of renewable water consumption for agricultural purposes from 17 to 10 billion cubic metres, and increase the percentage of agricultural wells with metering gauges installed to 30 per cent.

### 3. Arab countries in conflict

The tensions surrounding access to water resources can be a contributing factor to conflict. Water supplies can also fall victim to conflict, either intentionally or as collateral damage. The politicization and weaponization of water resources remain major challenges. Further, water scarcity and its direct impacts on drinking water availability, sanitation, health and ecosystems can be pull or push factors for migration, often causing additional stresses on areas where water is available.

WASH services often operate below capacity in Arab conflict-affected countries due to degraded and unmaintained infrastructure, frequent power outages and inadequate complementary infrastructure. Conflict and continued unrest have led to the unregulated use of available water resources and the contamination of water sources, heightening the risk of disease outbreaks and waterborne illnesses. Conflict also intensifies displacement, human mobility and the risks associated with daily movements to collect water, including gender-based violence.



## The impact of occupation and war on the water sector in the occupied Palestinian territory

The **State of Palestine** has grappled with water insecurity for decades as a result of occupation by Israel and its restrictive and destructive measures. Since 1967, Israel has controlled all water resources in the occupied territory, stifling Palestinian access to ground and surface water. Israeli policies and measures impede new water infrastructure projects and the rehabilitation of existing infrastructure. In addition, Israel has destroyed water-related facilities and deprived Palestinians of their share of Jordan River water. At the same time, Israel has developed its own water infrastructure for its settlements. As a result, Palestinians suffer from water shortages and only 6.8 per cent of the cultivated land in the West Bank is irrigated. The daily share of water per capita for Palestinians (89 litres) is below the minimum recommended by WHO (100 litres) and nearly one third of the average share consumed in Israel and the settlements (242 litres). Israeli exploitation of water resources in the occupied Palestinian territory and denial of adequate access to safe water and sanitation to civilians are violations of international humanitarian and human rights law.

In Gaza, the only aquifer has been depleted by overextraction and contamination by sewage and seawater infiltration, leaving 97 per cent of its water unfit for human consumption. Even before the war erupted in October 2023, the combination of the 16-year blockade and recurrent military escalations had devastated water infrastructure. The war and siege imposed by Israel have dramatically restricted the water supply, with water consumption per capita plunging from 82.7 litres per day before the war to 1 to 3 litres in November 2023. This is a fraction of the absolute minimum of 15 litres per person per day designated by WHO for a humanitarian emergency. The population has been forced to use unsafe water and sanitation facilities, exacerbating public health risks. Water is now being collected via rudimentary methods to meet the most basic needs.

Occupation and war continue to hinder development in Palestine, including efforts to achieve universal access to safe drinking water ([SDG target 6.1](#)) and substantially reduce the number of people suffering from water scarcity ([SDG target 6.4](#)). Recovery and development cannot progress without addressing the root causes of the conflict and restoring the access of Palestinians to their natural resources.

**Sources:** ESCWA, 2023c; MAS, 2013; United Nations, 2022, para. 35; ITRC and UNOPS, 2018; B'Tselem, 2011; Palestinian Central Bureau of Statistics, 2023.

◆ **Water and sanitation access needs to be secured by repairing and building infrastructure and preparing for risks**, including through capacity-building and community participation. Bridging the gap between humanitarian assistance and development aligns with the humanitarian-development-peace nexus approach. Moreover, collaboration between humanitarian and development actors, alongside WASH service providers, is essential for formulating emergency preparedness plans tailored to acute crises.

◆ **There is a need to address water quality concerns and protect human health**, such as by managing water sources and treating wastewater to prevent the spread of waterborne diseases. Strategies in Arab conflict-affected countries comprise monitoring and surveillance, water treatment, and public awareness and education.

◆ **Implementing solutions that address the interlinkages and interaction of water and fragility is vital**. Conflict-affected countries are shifting towards more integrated approaches, focusing on resilience and sustainability, conflict-sensitive water programming and community-based measures.

◆ **Existing policies and practices do not sufficiently acknowledge the potential of integrated human mobility solutions in tackling water-related challenges**, nor do they recognize IWRM as pivotal in safeguarding the human rights of displaced persons, refugees and migrants.

◆ **Conflict exacerbates existing gender inequalities in water and sanitation, making women's inclusion in the sector even more vital**. This applies to the adoption of gender-responsive policies as well as the participation of women in decision-making and management. Prioritizing women's leadership and expertise can address gaps in local capacity created by conflict-induced displacement and casualties. Women's participation is crucial for building equitable water solutions, especially in conflict zones where women and children bear the burden of water collection.







This section provides examples of policies that address the specific circumstances and needs of vulnerable groups in the Arab region. All States, regardless of whether they have specific policies for vulnerable groups, fall under international human rights law and have a responsibility to work towards achieving universal access to water and sanitation for all, without discrimination, while prioritizing those most in need.



◆ **Inhabitants of rural and remote areas** face significant disparities in access to WASH services compared to their urban counterparts. They grapple with much lower levels of access to safe drinking water and sanitation services as well as to basic handwashing facilities within premises. They also have a higher prevalence of open defecation.

- ◆ In **Morocco**, the National Strategy for the Development of Rural and Mountainous Areas and the Programme for the Reduction of Territorial and Social Disparities seek to reduce territorial gaps in access to basic services, including drinking water, particularly in rural and mountainous areas. The programme aims to extend the drinking water network over 668 kilometres, install 244 individual connections, dig 9,511 water points and develop 60 drinking water supply networks.<sup>32</sup>
- ◆ In **Saudi Arabia**, the National Transformation Programme allocated 200 million Saudi riyals for water supply social insurance programmes for desert villages between 2016 and 2021.



◆ **Persons living in poverty** are more likely to have insufficient water and sanitation facilities and often need to pay more for water than residents in wealthier areas.

- ◆ In **Iraq**, the Poverty Alleviation Strategy aims to establish reverse irrigation stations, distribute water sterilization pills and deliver water trucks to groups below the poverty line, while also raising awareness of the importance of using water that meets minimum standards for human consumption.<sup>33</sup>
- ◆ In **Tunisia**, the National Programme for the Sanitation of Working-Class Neighbourhoods has connected 1,146 low-income neighbourhoods to sanitation networks since 1989, benefiting around 1.4 million people, most from governorates with the greatest needs.<sup>34</sup>



◆ **Women and girls** bear the brunt of inadequate and gender-unresponsive WASH services. These result in heightened maternal morbidity and mortality rates, increased school dropout rates among girls, reduced food security and diminished agricultural livelihoods. Women and girls are also exposed to an elevated risk of sexual abuse and harassment, particularly those who are displaced or live in refugee settlements and places without access to private facilities.

- ◆ In **Somalia**, the WASH Sector Strategic Plan (2019–2023) set a national target of 90 per cent of adolescent girls in upper primary and secondary schools having access to menstrual hygiene kits in 2023.<sup>35</sup>
- ◆ In the **Sudan**, the National Water Policy (2016) advocates for gender equality in access to water resources as well as the inclusion of women in decision-making processes and the management of water service providers. Nonetheless, significant gaps remain in implementing the policy and ensuring that women's needs are met.



◆ **Refugees and IDPs** often lack access to safe water and proper sanitation facilities, which increases their vulnerability to illness and disease.

- ◆ In **Jordan**, the National Resilience Plan (2014–2016) sought to mitigate the impact of the influx of Syrian refugees on host communities by improving the delivery of WASH services and promoting community participation and awareness-raising among local Jordanian populations and Syrian refugee community groups. The Jordan Response Plan for the Syrian Crisis (2016–2018) dedicated significant resources to expanding wastewater collection and treatment in host communities.<sup>36</sup>



◆ **Migrants** often rely on less durable infrastructure, are exposed to frequent disruptions to water and sanitation

services, and are among the groups most vulnerable to extreme weather events. Low-skilled migrant workers face discrepancies in access to WASH services due to subpar remuneration, poor work conditions, weak labour inspection systems and a lack of social security.

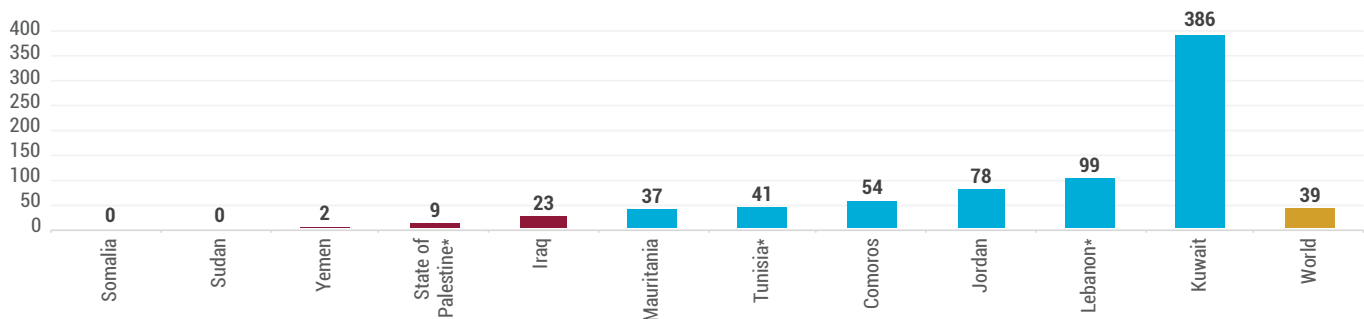
- ◆ In **Qatar**, legislation states that to protect workers from heat stress, employers must provide free and suitably cool drinking water to all workers throughout their working hours.<sup>37</sup>

## E. The financing landscape

Financing is one of the main accelerators of progress towards SDG 6 and the goals of the Water Action Decade in the Arab region.<sup>38</sup> Countries need to increase financing efforts, leverage climate finance, improve coordination across ministries and institutions, and explore innovative financing solutions. Creating an enabling environment is essential for attracting additional funding, as policies and regulations can encourage new funding sources and foster partnerships with the private sector.

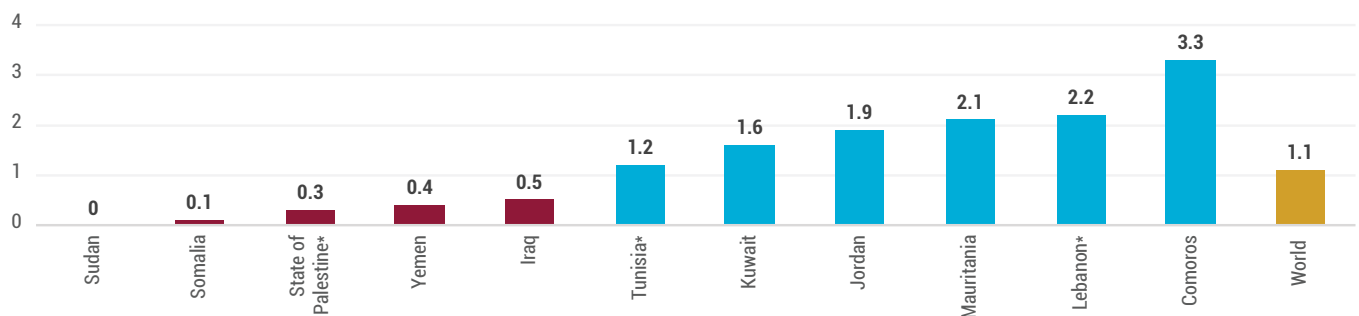
**WASH expenditure varies significantly across the region.** In conflict-affected countries, less is spent on WASH per capita than in countries not affected by conflict. Non-conflict least developed and middle-income countries, such as the **Comoros, Jordan, Lebanon** and **Mauritania**, spend a greater proportion of GDP on WASH compared to the world average or high-income **Kuwait** (figures 6.6 and 6.7).

**Figure 6.6**  
WASH expenditure per capita, 2021 (Dollars)



Source: WHO, 2023b.  
Note: An asterisk (\*) denotes data from 2020.

**Figure 6.7**  
WASH expenditure as a percentage of GDP, 2021 (Percentage)



Source: WHO, 2023b.  
Note: An asterisk (\*) denotes data from 2020.

**Climate finance for the water sector is insufficient** despite considerable water-related financing needs. Countries have indicated a total financing requirement of \$127.5 billion for climate adaptation in the water sector but received only \$6.9 billion in water-related international public climate finance from 2010 to 2021.<sup>39</sup> The water sector accounted for only 14 per cent of climate finance flows to the region from 2010 to 2020, despite being a priority area for adaptation. The sector lagged significantly behind energy, which received 35 per cent of inflows over the same period.<sup>40</sup> Countries require assistance in accessing climate finance, including to navigate arduous processes to obtain it.

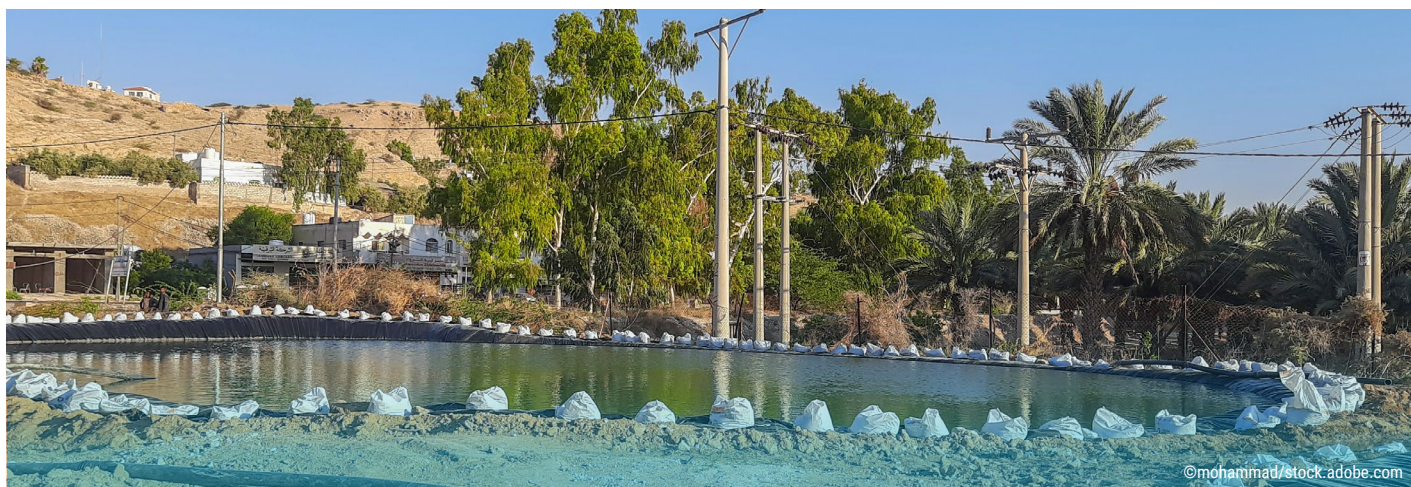
Accessing climate finance for WASH projects requires a compelling demonstration of a clear climate rationale. These projects must articulate how they generate climate benefits beyond their standard operations.

**There are opportunities to increase funding to the water sector via innovative financing tools**, such as blue and other sustainability-linked bonds, climate and SDG debt swaps, and the use of IMF special drawing rights. High subsidization and low-cost recovery may suggest the potential for policy improvements to better target populations in need of subsidies.

**In countries facing conflict, instability often leads to short-term spending and discourages long-term investments in water and sanitation.** For example, while **Libya** is highly vulnerable to the impacts of climate change, adaptation does not receive sufficient investment from the Government or development partners.<sup>41</sup> New ways to finance the WASH sector are needed in conflict settings, where the State may be weak and unable to accept funds

or operate services. This could include running pilot projects to support water infrastructure and systems at the subnational or community level.

- **Egypt** has employed subsidies to address challenges in the wastewater sector, where regional water and sanitation companies struggle to generate enough revenue from tariffs to cover costs. To bridge this financial gap, the Government has introduced a system of capital grants tied to the performance of rural sanitation providers, measured by various indicators. Payments are disbursed once these providers reach specific performance benchmarks, ensuring a steady cash flow that enables incremental improvements.
- **Egypt** issued the Arab region's first sovereign green bond in 2020, financing budgetary expenditures in the WASH and transport sectors. Nearly 54 per cent of the proceeds were allocated to 14 WASH projects, including the *El Dabaa* desalination plant, 9 wastewater treatments plants and 4 sludge treatment facilities, benefiting 16.9 million people. The bond aligned with government priorities to integrate sustainability considerations into public budget financing plans, diversify the investor base and encourage private sector engagement in sustainable financing. Prior to issuing the bond, the Government established a Green Financing Framework, which ensured a transparent and accountable approach to sustainable financing through green bonds and *sukuks*.
- In **Jordan**, the expansion of the *As-Samra* wastewater treatment plant was achieved through a partnership involving the Government of Jordan, the private sector and the Government of the United States. Operational since 2015, this project has extended sewer networks and significantly increased the use of treated wastewater for irrigation. It contributed to an additional water supply of 4 million to 6 million cubic metres per year as of 2020.<sup>42</sup>



## F. Regional dimensions

- **The Arab Strategy for Water Security in the Arab Region (2010–2030)**, approved by the Arab Ministerial Water Council in 2011, provides a regional policy framework on water. At the subregional level, the Gulf Cooperation Council countries have adopted the **Gulf Cooperation Council Unified Water Strategy (2016–2035)** and its associated operational plan. Some States have water strategies involving Arab and non-Arab neighbouring countries, including the **Water Strategy in the Western Mediterranean** and the **Water Vision of the Organisation of Islamic Cooperation**.
- The **Arab Ministerial Water Council** is an intergovernmental organization affiliated with the League of Arab States that facilitates cooperation in areas related to water. A **Joint Ministerial Council of Ministers of Water and Ministers of Agriculture**, which addresses water and food security challenges, adopted the Cairo Declaration, emphasizing sectoral collaboration and the development of a new generation of policies and innovative investments in agriculture and water. The declaration also calls for enhancing policy coherence through reviews of sectoral policies on cross-cutting issues, including water allocation, non-conventional water resources, trade and social protection.
- Cooperation on water-related issues at the subregional level includes the **Maghreb Initiative for Non-conventional Waters**. This initiative seeks to establish a permanent technical committee on non-conventional water within the Arab Maghreb Union, a subregional centre of excellence on non-conventional water resources, and a collaborative platform to promote knowledge-sharing and the exchange of good practices.<sup>43</sup>
- **Transboundary water cooperation** is a critical requirement for water security in the region as two thirds of freshwater resources are shared by neighbouring countries. Such cooperation remains limited, however. Only 30 per cent of cross-border surface water basins and aquifers had an operational arrangement for water cooperation in 2020.<sup>44</sup> Despite these challenges, notable examples of positive regional water cooperation arrangements include the North-Western Sahara Aquifer System, involving **Algeria, Libya and Tunisia**, and the *Al-Saq/Al-Disi* aquifer cooperation agreement between **Jordan and Saudi Arabia**.
- Obstacles to the establishment of comprehensive cooperation frameworks in the region include a lack of knowledge and data exchange<sup>45</sup> as well as financial constraints. Transfers of experiences and knowledge from cooperation arrangements could accelerate progress at a regional scale and reduce potential threats to collaboration. Moreover, funding for basin-level, aquifer-level and transboundary water projects could open opportunities to enhance water cooperation.<sup>46</sup>
- **Human mobility, including migration and refugee flows**, is another WASH-related issue that can benefit from regional cooperation. Protracted conflict has led millions of people to cross borders in search of security and livelihoods, compounding pressures on water resources and services in host countries and communities. One example was the arrival of Syrian refugees in **Jordan and Lebanon** after 2011.
- Rainfall variability, higher evapotranspiration rates, ecosystem degradation and extreme weather events associated with climate change adversely affect freshwater availability, agriculture and food security, contributing to the decision to migrate. Issues associated with environmental degradation, water stress and food security are expected to prompt increased internal and cross-border population movements, including migration and refugee flows. Environmental changes often exacerbate the pre-existing vulnerabilities of migrants, including people in displaced communities, who typically rely on natural resources for livelihood activities and have limited access to basic services such as water and sanitation to sustain well-being, health and dignity. For example, in **Djibouti**, water scarcity and strained services have constricted access to safe water for nearly 100,000 drought-affected people along migration routes, including sedentary rural populations, refugees and asylum seekers.<sup>47</sup>



## Endnotes

1. Algeria, Bahrain, the Comoros, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Oman, Qatar, Saudi Arabia, the State of Palestine, the Sudan, the Syrian Arab Republic, the United Arab Emirates and Yemen (League of Arab States, 2023).
2. All Arab countries that were Member States of the United Nations with the exception of Mauritania, which was absent.
3. Bahrain, the Comoros, Egypt, Iraq, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Somalia, the State of Palestine, the Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen (WHO, 2022a; Saudi Arabia, 2018; United Arab Emirates, 2021a).
4. Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, the State of Palestine, the Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen (WHO, 2022a; Algeria, 2014; Qatar, 2018; Saudi Arabian Standards Organization, 2000; United Arab Emirates, 2021a).
5. Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, the State of Palestine, the Sudan, Tunisia and the United Arab Emirates (WHO, 2022a; United Arab Emirates, 2021a).
6. Bahrain, the Comoros, Egypt, Iraq, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, Somalia, the State of Palestine, the Sudan, the Syrian Arab Republic, Tunisia and Yemen (WHO, 2022a).
7. Bahrain, the Comoros, Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, the State of Palestine, the Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen (WHO, 2022a; WHO, 2018).
8. Bahrain, Egypt, Iraq, Jordan, Kuwait, Morocco, Oman, Somalia, the State of Palestine, the Syrian Arab Republic and Tunisia (WHO, 2022a).
9. Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, the State of Palestine, Tunisia and Yemen (ESCWA, 2016).
10. Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Libya, Mauritania, Morocco, Oman, the State of Palestine, Tunisia and Yemen (ESCWA, 2016).
11. Bahrain, the Comoros, Egypt, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, Saudi Arabia, Somalia, the State of Palestine, the Sudan, the Syrian Arab Republic, Tunisia and Yemen (WHO, 2022a; Saudi Arabia, 2018).
12. Bahrain, the Comoros, Iraq, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, Somalia, the State of Palestine, the Sudan, the Syrian Arab Republic, Tunisia and Yemen.
13. Calculations by ESCWA, based on Voluntary National Review reports.
14. Mateo-Sagasta and others, 2023. Figures exclude the Comoros, Djibouti and Somalia.
15. Bahrain, Egypt, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, Qatar, the State of Palestine, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen (WHO, 2022a; Qatar, 2018; United Arab Emirates, 2021b).
16. Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, the State of Palestine, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen (WHO, 2022a; Algeria, 2007; Nassif, Tawfik and Abi Saab, 2022; Dare and others, 2017).
17. ESCWA, 2021a.
18. Including Algeria, Bahrain, the Comoros, Djibouti, Egypt, Jordan, Lebanon, Mauritania, Morocco, Oman, Saudi Arabia, Somalia, the Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen.
19. Including Bahrain, Egypt, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic and the United Arab Emirates.
20. Including Bahrain, Jordan, Lebanon, Oman, Qatar, Saudi Arabia and the Syrian Arab Republic
21. ESCWA, 2023b.
22. ESCWA and UNEP-DHI Centre on Water and Environment, 2021.
23. ESCWA, 2022a.
24. Bahrain, the Comoros, Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, the State of Palestine, the Sudan, the Syrian Arab Republic and Tunisia (WHO, 2022a).
25. ESCWA, 2023b. Basic drinking water and sanitation services (SDG indicator 1.4.1) are used here as a proxy for safely managed drinking water and sanitation services (SDG indicators 6.1.1 and 6.2.1) due to insufficient data availability for the least developed countries and other subregions.
26. ESCWA, 2023b.
27. In 2018, a mere 0.6 per cent of population in the Comoros practiced open defecation, with the same rate observed in rural areas.
28. Based on data from WHO (2022a) for five least developed countries (the Comoros, Mauritania, Somalia, the Sudan and Yemen). Information on Djibouti was not available.
29. ESCWA, 2023a.
30. UNDP, 2022.
31. Water policies in Gulf Cooperation Council countries are guided by the Gulf Cooperation Council Unified Water Strategy (2016–2035) and its operational plan.
32. Morocco, 2023.
33. WHO, 2022a.
34. Tunisia, 2021.
35. Somalia, 2019.
36. Jordan, 2014; UNESCO, 2017.
37. Qatar, 2020.
38. ESCWA, 2022a.
39. ESCWA, 2023a.

40. ESCWA, 2023d.
41. United Nations, 2021a.
42. ESCWA, 2023a.
43. FAO, 2021.
44. ESCWA, 2023b.
45. ESCWA, 2021b.
46. ESCWA, 2023d.
47. UNICEF, 2018.

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