



# Opportunities for integrated water management



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Consistently listed as [one of the top five global](#) global water crisis has become a reality for countries currently living in areas of extremely high population will more than double. At the same time, around the world, resulting in further needs. And with climate change spawning heavier precipitation and frequently occurring droughts, adequate infrastructure water cycle.

To tackle the objectives of SDG 6 — the United Nations availability and sustainable management of water and sanitation, water strategies and objectives. As a result, initiatives related to water efficiency, water conservation, and developing back on water usage. And SDG 6 is just part of the picture, which has been further amplified by the COVID-19 pandemic.

### Exhibit 1: Key water stress hotspots

Addressing sustainable water management is a complex feat in and of itself. Water a primarily



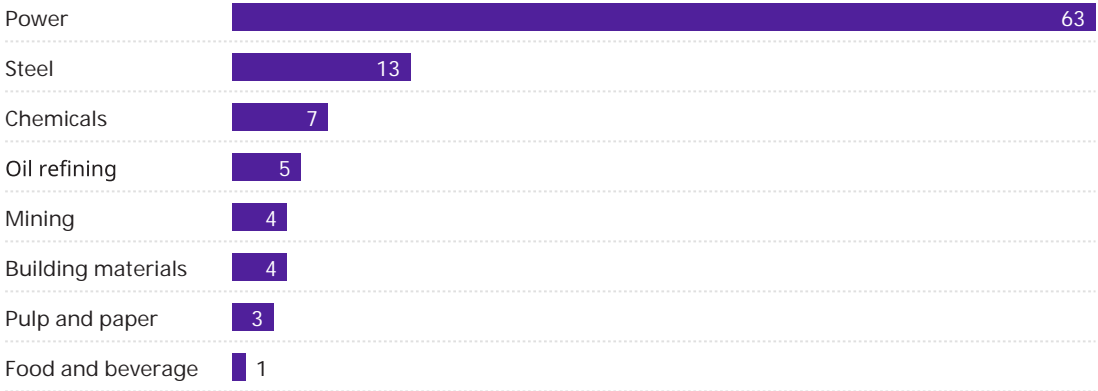
**Exhibit 4:**

Decision-makers have historically prioritized wastewater treatment lower than water supply services, ultimately resulting in untreated waste being discharged into the environment. The use



**Exhibit 7: Water withdrawals by industry**

In billion cubic meters per year







To improve water conservation in the Murray-Darling basin, the Australian government is funding efficient irrigation programs. Approximately AUD 500 million will fund the installation of smart irrigation and drip irrigation devices to achieve savings of 187 million liters in the long term for the basin. Likewise, Saudi Arabia has succeeded in reducing water consumption by restricting agriculture, wheat cultivation, and green fodder production. The latter is expected to lead to nine billion cubic meters in water savings, equivalent to more than 50 percent of water consumption required for production.

While programs and initiatives are essential to develop sustainable water supply infrastructure and demand management practices, these require the proper enablers to succeed.

Implementing policies to provide water security and increase performance efficiency of systems requires adequate water governance through effective and efficient institutions. Financial investment is required to develop infrastructure that requires high capital. In addition, financial incentives must be in place for water efficiency and conservation initiatives. Likewise, capacity development and technology will create the knowledge and tools to ensure that future challenges are properly met, and that program and initiative objectives will be sustainable in the long-term.

The institutional enablers for water security

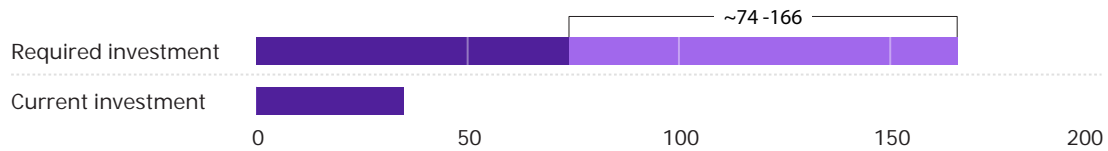
Exhibit 9: Institutional set up in selected countries

	Policy maker	Water resource manager	Regulator	Service provider
United Kingdom	●	●	●	● ●
France	●	●	●	● ● ● ●
United States	●	●	●	● ● ● ●
Australia	●	●	●	● ● ●
Singapore	●	● ●	●	● ● ●
United Arab Emirates	●	●	●	● ● ●
Chile	●	●	●	● ●
Saudi Arabia	●	●	● ●	● ● ●
Japan	●	●	●	● ●

● Ministries    
 ● Agencies    
 ● Regulators    
 ● Public entities    
 ● Integrated  
● Private entities    
● Unbundled

**Exhibit 10: Annual investment required to achieve SDG targets 6.1 and 6.2**

\$US billions



Source: Hutton & Varughese □ World Bank (2016); Oliver Wyman analysis

A lack of financing to address water-related challenges will further exacerbate economic losses caused by water-related issues. Losses in agriculture, health, and income from similar issues can result in up to a six percent reduction in GDP in the Middle East by 2050<sup>2</sup>. Likewise, food damages to urban properties result in annual losses of up to \$120 billion<sup>3</sup>.

Recognizing the complexity of water-related challenges will require creative solutions. Capacity development programs are therefore required to systematically identify required knowledge, assess knowledge gaps, and ensure that such gaps are closed so that professionals can address challenges.

And while programs and initiatives may create immediate and short-term impact, the long-term sustainability of such initiatives must be ensured by developing required capacity. This may encompass professional on-the-job training, as well as involvement in water education networks, universities, research programs, and e-learning programs.

Organizations and institutions must enhance their knowledge transfer mechanisms, including processes and procedures, to promote both explicit and tacit knowledge required to solve water-related problems.

Recently, the adoption of digital technologies such as the internet of things and big data by professionals has enabled further enhancement of water system efficiency. Leveraging the potential of innovative technology is critical to address water-related challenges. Through the maintenance costs are reduced, and performance is subsequently enhanced.

The creation of clusters to drive research and development has been a key success factor, as seen in Singapore. It will require a balanced investment between public and private entities, including universities and start-ups, to name a few. Such clusters will advance technology to increase water system efficiency and reduce costs.

While an overwhelmingly large number of approaches to water management exist which can be challenging to adopt on their own, an integrated approach is necessary to deliver impactful results. Water stress is an increasing reality worldwide, and coupled with climate change, poses

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