Opportunities for integrated water management

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Consistently listed as one o th op fve glob
global water crisis has bec me reality for c
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To tackle the objectives of S G — the Unite
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back on water usage. And S C is just part
been further ampli fed by t VID-19 panc

Exhibit 1: Key water stress spots

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

Exhibit 8: Potential actions for agricultural water demand management

Improve irrigation techniques and farmers awareness	Crop selection • Restrictions on crop selection • Subsidies for crop switch • Adjustment of planting date Water tari f s • Cost-re f ective water tari f s •

To improve water conservation in the Murray-Darling basin, the Australian government is funding e f cient 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 e f ciency of systems requires adequate water governance through e f ective and e f cient institutions. Financial investment is required to develop infrastructure that requires high capital. In addition, f nancial incentives must be in place for water e f ciency 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.

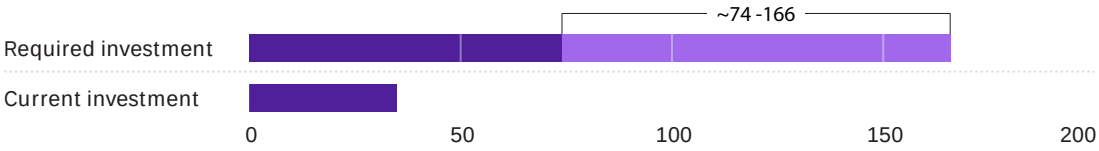
The institutionaea[illegible]

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[2]. Likewise, food damages to urban properties result in annual losses of up to $120 billion[3].

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 e f ciency. 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 e f ciency 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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