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Advancing water sustainability in Bahrain through water resource management knowledge platforms

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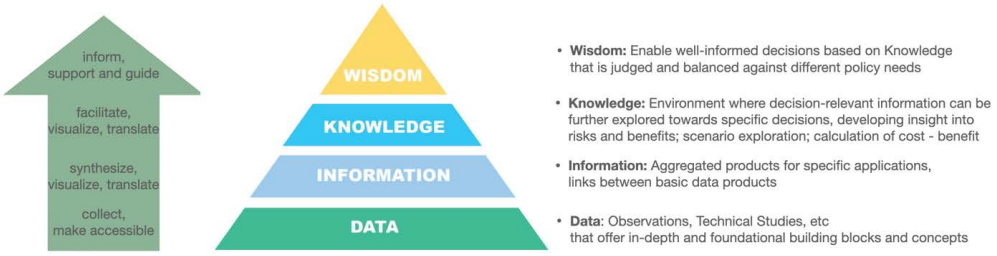
ABSTRACT

Water management poses a critical challenge for Bahrain, as demonstrated by the country's integrated water resources management SDG 6.1.5 scoring of 39/100 for 2020. However, the Kingdom is engaging progressive and proactive institutions, such as the Ministry of Oil of Bahrain (MOO), to respond to these challenges. MOO is working to implement a countrywide Integrated Water Resources Management (IWRM) program with the aim of building a resilient water sector for future development and climate change in the Kingdom of Bahrain. To this end MOO is hosting the Water Resources Management Unit (WRM) to implement this project. Through this activity, MOO has identified specific IWRM needs such as tool development and practical process support to address the country's sustainability goals. MOO/WRM and their partners are developing and implementing core building blocks for monitoring and analysis of water resources information, scenarios and alternatives, which should help guide their IWRM efforts. These tools and capabilities, strengthened by a targeted capacity-building program, will assist the Kingdom to improve water sector data information sharing, to open doors for improved public participation in IWRM dialogue, while actively identifying, designing, and evaluating the potential impacts of water management policies and projects.

Developing new IWRM plans at the country-level involves understanding assumptions regarding water demand projections as well as favored water supply and wastewater treatment options. However, such preconditions might not be the optimal balance between infrastructure and other strategies available to water resources planners and decision makers to optimize the potential impacts of various water resources management levers on quality potable water service provision, maximization of water reuse, and reduction of the environmental impacts of water production and wastewater discharge. The tools developed for WRF support should be flexible and extensible, in the case of Bahrain allowing for the analysis of key uncertainties such as climate change and



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the costs of labor and energy inputs, as well as strategies such as artificial groundwater recharge, rainwater harvesting, and greywater reuse in new constructions.

Therefore, developing and implementing a comprehensive and flexible IWRM model that takes into account a variety of uncertainties, and both infrastructure and other strategies can be a constructive driver for identifying solutions that enhance the resilience of the country's water resources. The new WRM planning and analytical tools will be developed in an open data environment that can link water to energy, industry, health, environment and other sectors, and will include two allied Knowledge Platform elements, (1) a Decision Support System (DSS) based on the Water Evaluation and Planning (WEAP) model; and (2) a web-based Water and Climate Knowledge Platform (WCKP). Together, these will serve as quantitative modeling environments to assess water resource vulnerabilities and potential impacts of water management strategies.

Keywords: Water management; Water resources; Sustainability