

EXECUTIVE SUMMARY



West Asia (WA) countries have been experiencing different degrees of natural and anthropogenic water risk affecting the sustainability of their limited water resources and preservation of the ecosystem equilibrium. The fragile arid environment and its resiliency to cope with external natural and anthropogenic activities, including the expected impacts of climate change, present a major challenge to decision-makers who must achieve adequate, safe and dependable water and food supply in the future to improve human well-being in their societies, and to meet the requirements of future generations.

The WA region can be classified according to water resource availability, population growth and economic activities into two distinct sub-regions, the Mashriq and Yemen (Iraq, Jordan, Lebanon, the Occupied Palestinian Territories (OPT), Syria and Yemen) and the Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE). The whole region, however, is suffering from water scarcity, which is attributed to large temporal and spatial variations in most hydrological parameters, especially precipitation and evaporation rates. The most significant parameter causing environmental stress is the rainfall pattern, which influences the generation and dependability of freshwater availability in terms of volume, frequency and distribution. Climate change will further increase the variability of rainfall, adding more uncertainty and complication to the planning and management processes of the water sector. Rainfall distribution in the two sub-regions shows that 72 per cent of the region receives on average less than 100 mm mainly in the GCC countries, 18 per cent of its area receives 100-300 mm and only 10 per cent receives more than 300 mm.

Understanding the vulnerability of freshwater resources in WA is therefore vital to ensuring sustainable water management in the region.

Undertaking a vulnerability assessment of freshwater will highlight gaps in information and identify the most dominant factors that influence vulnerability, in addition to enhancing public awareness. The availability of such an assessment will provide decision-makers with options to evaluate and modify existing policies and implement measures to improve water resources management.

The approach used for this vulnerability assessment was based on the methodological guidelines prepared by UNEP and Peking University. According to these guidelines, a vulnerability assessment must have a precise understanding of four components of the water resource system, namely: total water resources, water resource development and use, ecological health and conflict management.

The pressing concern of freshwater vulnerability in WA facing decision-makers now and in the future requires the development of policies that take into consideration the continuous increase in water demand from a changing environment. Solutions can be mapped along a continuum from those where proven solutions are available, to those where understanding of the problem and its solutions are still emerging. It is clear from the above analysis that the vulnerability of freshwater resources in WA countries is a result of inadequate management levels and will be exacerbated by the effects of climate change.

The main water management challenge facing WA countries is the increasing stresses and deterioration of the region's limited natural water resources by increasing water demands. This has significant implications not only for the future development of these countries, but also for the sustainability of their past socio-economic achievements. The lack of integrated water management policies and adequate legislative frameworks, and institutional weakness, coupled with management

practices focusing on 'supply-side' management without giving adequate attention to 'demand-side' management, has contributed to increasing freshwater vulnerability in most of the countries of the region. Policy reforms, with emphasis on demand management, conservation and protection, as well as the improvement of the legal and institutional provisions are keys to efficient development and management of water resources and must be given the utmost attention to reduce the vulnerability of freshwater in the region.

It is expected that climate change will impose further stresses on the limited freshwater resources in WA countries and intensify their vulnerability. This is of particular concern for those countries relying on shared water resources, which in the absence of sharing agreements will increase tensions between riparian countries. The issue of shared water resources should be given high priority by WA countries to finalize water resources sharing agreements according to international water laws. Large water savings opportunities exist in the agricultural sector, which accounts for more than 80 per cent of total water consumption in the region (FAOSTAT, 2009) and where most water wastage occurs. Savings are possible by increasing irrigation efficiency with the introduction of enhanced irrigation and agricultural techniques, reuse of treated wastewater, augmentation by agricultural drainage water, and the implementation of incentive/disincentive systems.

Municipal wastewater has become an increasingly significant source of water with considerable potential for alleviating water scarcity in the region, particularly since the volume available proportionally increases with that of urban consumption. With proper treatment, municipal wastewater can be used to supplement water demands in the agricultural and industrial sectors, as well as in managed aquifer recharge (MAR) schemes. While increasing reliance

on desalinated water in the region is inevitable in the future and contributes to decreasing water scarcity, especially for GCC countries, desalination technology has many drawbacks: it is capital and energy intensive, is largely imported, provides limited added value to countries' economies, and has many negative environmental impacts. There is an urgent need for cooperation among WA countries and with other Arab Countries for investment in research and development (R&D) for desalination technologies, with the aim of acquiring and localizing these technologies in the region. This would have many advantages, including reducing costs, increasing the reliability of supply, increasing value for countries' economies and reducing the environmental impacts of desalination.

The issue of water resources management should be high on the national agendas of WA countries. Political action is needed for the sustainable management of water resources and is a necessary prerequisite to reducing freshwater vulnerability in the countries of the region.

In order to cope with water scarcity and lower freshwater vulnerability in the region, a major shift to demand management, water use efficiency and conservation needs to be happen. This should focus on the agricultural sector where most water savings can be achieved. Furthermore, there is an urgent need to strengthen and reinforce the capacity of water institutions to deal effectively with water issues in a holistic approach through legal and institutional frameworks. Vulnerability and adaptation to climate change need to be integrated into future water resources management policies at the national level. A key role for concerned institutions to achieve this goal is to provide knowledge and promote awareness.