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Water security and climate change

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The term water security appears to have emerged at the 2nd World Water Forum in 2000. Shortly thereafter, water security achieved further prominence when it was identified, conceptualized and operationalized by the international water community. At present, water security is generally perceived as one of the main objectives of water resources management. As water security is a rather new concept, definitions of the term are evolving. Reviewing key definitions of the term, as introduced by international agencies, academic researchers and practitioners, suggests that water security refers to the "the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water related risks to people, environments and economies". Water security can be thought of as the adaptive capacity expressing the status of water management, both to enhance its productive potential and to mitigate its destructive potential.

Water security is not only about having enough water. Water security goes beyond water scarcity to take into account not only availability of water resource but also the productive and protective actions to secure water. Water security has three key dimensions: social equity, environmental sustainability, and economic efficiency. Water security comprises complex and interconnected challenges and highlights water's importance for achieving a wider sense of security, sustainability, development and human well-being. Water security is, therefore, also about mitigating water-related risks, such as floods and droughts, addressing conflicts that arise from disputes over shared water resources, and resolving tensions among the various stakeholders who compete for a limited resource. Water security is addressed through two main approaches. One is a developmental approach that seeks to improve water security over time through a combination of policies, reforms, and investment projects. The second is a risk-based approach, which seeks to manage risks and reduce vulnerability to water-related disasters. However, the two approaches are complementary, and need to be pursued simultaneously and in a balanced manner. Addressing water security, therefore, requires interdisciplinary collaboration across sectors, communities and political borders.

A water-secure world harnesses the productive power of water and minimizes its destructive force. It is a world where every person has enough safe, affordable, clean water to lead a healthy and productive life. It is a world where communities are protected from water-related disasters. Water security promotes environmental protection as well as social justice, and addresses the consequences of poor water management. There is now growing international consensus for increasing water security in a sustainable manner and for building more resilient and robust water systems. However, challenges to increase water security are rooted in political, economic, social and environmental issues specific to each country.

Improving water security requires understanding and managing for a changing and unpredictable climate. Climate change will bring about severe economic, social and environmental effects, which require both mitigation and adaptation. The Intergovernmental Panel on Climate Change (IPCC) alerted the global community to the great vulnerability of freshwater resources as a result of climate change. The major impact of climate change will be on the water cycle, and water is the main way through which the impacts of climate change will be manifested around the world. Climate change inevitably will ultimately result in changes in the timing of delivery, availability, distribution and quality of water resources. These shifts severely impact lives and livelihoods. Decreased water supplies mean more human suffering and increased risk of instability, violent conflict and migration. In addition, climate change will result in increased uncertainties, stress and potential for conflicts in water management. These changes are expected to produce threats to water security. Such threats are likely to be amplified by the related uncertainties. Hence, climate change is likely to increase the complexity and costs of ensuring water security.

The combination of hydrological variability and extremes, pertinent to climate change, is at the heart of the challenge of achieving basic water security. The water security challenge will, therefore, be aggravated by climate change and it will require significant adaptation. Achieving and sustaining water security against climate change is the immediate challenge of adaptation. Hence, the anticipated negative impacts of climate change on the functions and uses

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of water and on the associated risks to water security call for an adaptive management process. Resilience and adaptive capacity will become key attributes in the process and the relevance of security will simultaneously become greater.

The keynote speech discusses the concept of water security in the context of climate change with specific emphasis on Arab Region. Threats that climate change poses to water security will be examined. Giving more effort to measure water security and understand the climate change nexus is recommended. Since the context that informs water security is constantly changing, the need to adapt is clear. In the light of these, adaptation challenges to account for the risks posed by climate change to water security will be explored, along with the need for adaptive management as a possible solution.