

Opportunities and constraints for improved water resources management using different lenses and scales

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The quest for water security has been a struggle throughout human history. Only in recent years has the scale of this quest moved beyond the local, to the national and regional scales and to the planet itself. Absent or unreliable water supply, sanitation and irrigation services, unmitigated floods and droughts, and degraded water environments severely impact half of the planet's population.

Over the past few years, water insecurity has become recognized in the World Economic Forum global risk studies as one of the greatest threats that business leaders themselves see that they face in the future, both in terms of likelihood and scale. The scale and complexity of the water challenges faced by society, particularly but not only in the world's poorest regions, are now recognized, as is the imperative of overcoming these challenges for a stable and equitable world.

How can we ensure the well-being of all people and ecosystems with the water, human, technological, and financial resources available? In the framework of the Sustainable Development Goals water has to be managed more effectively and wisely by unlocking scientific, managerial, and business capabilities; breaking out of technological lock-in; and innovative and adaptive portfolios of solutions have to be developed while removing barriers to progress on sound water governance.

IIASA's Water Futures and Solutions Initiative (WFaS) is an unprecedented inter-disciplinary scientific initiative to identify robust and adaptive portfolios of optional solutions across different economic sectors, including agriculture, energy and industry, and to test these solution-portfolios with multi-model ensembles of hydrologic and sector models to obtain a clearer picture of the trade-offs, risks, and opportunities.

The results of WFaS scenarios and models will provide a basis for long-term strategic planning of water resource development. And given the complexity of the water system, WFaS will uniquely provide policy makers with optional sets of solutions that work together and that can be easily adapted as circumstances change in the future.

Water is also all about relationships. As WFaS progresses, it will establish a network involving information exchange, mutual learning and horizontal cooperation across teams of researchers, public and private decision makers and practitioners exploring solutions at regional, national and local scales. The initiative includes a major stakeholder consultation component, to inform and guide the science and to test and refine policy and business outcome.