

Theme	Global Climate Change
Topic	Mitigating Disasters
Main Question	How can we manage disasters in a dynamic bio-physical environment over which little human control is possible and in which existing institutional intervention is often based on past experiences that might not be totally appropriate?
Related sub-questions	<p><i>Question 1: How can we collectively mobilize the appropriate levels of second-order resources (technology, ingenuity, policy, human capacity, finances, institutional arrangements etc) to mitigate water-related disasters that impact on both the developed and the developing world?</i></p> <p><i>Question 2: What is the most appropriate strategy for the global water sector to collectively adopt in order to stimulate the levels of anticipatory response needed to mitigate water-related disasters?</i></p> <p><i>Question 3: How do we make the quantum leap needed to gain the levels of cooperation between Government, Society and Science in order to mitigate water-related disasters?</i></p> <p><i>Question 4: Is it appropriate to frame our thinking in terms of five major types of water-related disaster in order to develop appropriate responses or mitigation strategies?</i></p>
<u>General introduction</u>	<p>The world is currently characterized by two competing forces over which little human control is possible. On the one hand population growth is driving demand for natural resources in the quest for economic growth and development. On the other hand the environment in which social and economic systems are embedded is naturally dynamic with a human-induced signature that increases perturbations and makes our current capacity to predict somewhat limited.</p> <p>Within this broader set of conditions we have sub-elements such as an increased propensity to urbanization, often in areas that are disaster-prone. Associated with this is the reduction in the land and water resource-base on which human livelihood is dependent. These issues combine to produce a massive population of vulnerable people, often with tenuous links to livelihoods, sometimes without skills needed for a modernizing industrial economy.</p> <p>This opens up the discussion on the difference between a first and a second-order resource. A first-order resource is a natural resource like land, forests and water. A second-order resource is a social resource that can be best conceptualized as being the capacity of society to adapt to rapid changes in first-order resource availability, either as the result of a rapid change induced by a disaster, or as the result of a slower change driven by over-demand and thus manifesting as a chronic scarcity. From this it can be hypothesized that disaster mitigation is more likely to be effective in societies with a higher level of second-order resources (the capacity to adapt rapidly or the capacity to mitigate impacts as the result of previously thought through intervention strategies). Conversely, societies in which second-order resource scarcities are acute, will probably become increasingly disaster-prone over time.</p> <p><i>Resulting Question 1: How can we collectively mobilize the appropriate levels of second-order resources (technology, ingenuity, policy, human capacity, finances, institutional arrangements etc) to mitigate water-related disasters that impact on both the developed and the developing world?</i></p>

This discussion focuses on the notion of a second-order resource. Central to such a discussion is the role of strategy as a previously thought-through anticipatory approach to an as yet vaguely envisaged future state in which a major disaster can pose a direct threat. This can be further divided into two categories for analytical purposes. The first category arises from endemic disasters such as hurricanes, typhoons and cyclical flooding (monsoon). The essential characteristic in this category is that learning from past experiences can inform future strategies so a degree of anticipation of the nature and scope of an event can be factored into the process. The second category arises from unanticipated disasters that are rapid, catastrophic, but are not part of a cyclical pattern in a given area and thus not part of any institutional or social memory. An example of this could be a Tsunami arising from a tectonic event manifesting in an area that is not usually Tsunami-prone.

Resulting Question 2: What is the most appropriate strategy for the global water sector to collectively adopt in order to stimulate the levels of anticipatory response needed to mitigate water-related disasters?

The discussion thus far highlights the role of science in developing a social-level understanding of the responses needed to mitigate natural disasters. This takes us logically to the discussion over appropriate forms of cooperation between three major actor-clusters. The first actor-cluster can be thought of as government, with the task of making authoritative decisions that are applicable to society as a whole. The second actor-cluster can be thought of as science, with the task of developing certainty in their understanding of the drivers of natural disasters in order to make predictions with a high level of confidence. The third actor-cluster can be thought of as society, which consists of individuals, organizations and economic entities like corporations. The important issue that needs to be understood in the context of a disaster mitigation strategy is the way that these three actor-clusters interface. Collectively this process can be thought of as a Triologue in which Government, Society and Science is involved through a series of interfaces (see the Special Edition of Water Policy (Vol. 9, No. 2) for more information).

Resulting Question 3: How do we make the quantum leap needed to gain the levels of cooperation between Government, Society and Science in order to mitigate water-related disasters?

Given the complex range of disasters that can arise from water, from a policy-making perspective we can think of water problems in terms of five major categories, each of which needs a specific response. These five categories of water-related problem are:

- a) Too much – otherwise known as flooding. Here an appropriate response is a combination of infrastructure (dams and flood barriers), science (predictive tools) and policy (designed to mobilize the appropriate balance between science, infrastructure and society).
- b) Too little – otherwise known as scarcity or drought. Here an appropriate response is a combination of economic development (virtual water trading), infrastructure (irrigation dams and canals), science (modelling and the development of drought-resistant strains) and policy.
- c) Too dirty – otherwise known as pollution. This poses significant health impacts and also serves to reduce the availability of water for other productive economic activities, manifesting as an induced-scarcity. Here an appropriate response is the use of cleaner technology on which economic

	<p>development is based, but also the capacity to manage pollution arising from past economic activities.</p> <p>d) Wrong time – otherwise known as seasonal scarcity, often associated with winter rainfall (Mediterranean climate) or seasonal rainfall patterns (Monsoon) in which there is a cyclical oscillation between wet and dry periods, usually out of synchronization with cropping needs. Here an appropriate response is either inter-basin transfers of water or the development of inter-seasonal storage capacity.</p> <p>e) Wrong place – otherwise known as the spatial misdistribution of water, often with the economic needs of a country being dependent on a water resource that is geographically distant. Here an appropriate response is water transfer schemes and associated infrastructure, which result in a new form of vulnerability to disaster.</p> <p><i>Resulting Question 4: Is it appropriate to frame our thinking in terms of five major types of water-related disaster in order to develop appropriate responses or mitigation strategies?</i></p>
(Types of) Organizations to be involved in topic consultations	<p>Associations: NGO's; formal associations such as farmers unions, business councils etc.</p> <p>International Agencies: UNEP; UNESCO</p> <p>National Governments (Ministries of finance/agriculture/economic affairs/ science and technology)</p> <p>Regional organizations: SADC; AMCOW;</p> <p>Professional Associations: ICID; IAHS;</p> <p>Research Institutions: CSIR; CSIRO;</p> <p>Multilateral donors: World Bank, AFDB, ADB</p> <p>Environmental agencies / NGOs:</p> <p>Related national organisations, NGOs and Local civil society</p>
Process of paper and session development:	<ol style="list-style-type: none"> 1. Draft 1 of topic scoping paper to be sent to key institutions for comments 2. Improved draft to be placed on website 3. Improved draft with comments received to be discussed at the February coordinators meeting to: <ol style="list-style-type: none"> a. Agree on key questions b. Agree on the topic document so that it can be placed on the Forum website c. Agree on key stakeholders to take part in the development of the topic d. Agree on consultation process: relevant meetings with key stakeholders e. Agree on the process and actors to develop the forum session.

