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#1

Water security for a planet under pressure

Transition to sustainability: interconnected challenges and solutions



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Water is the common thread that links all aspects of human development. Water security is therefore vital to all social and economic sectors as well as the natural resource base on which the world depends. But an expanding population, growing economies and poor water management are putting unprecedented pressure on our freshwater resources. We simply cannot continue to use water as wastefully as we have in the past; we have to change the way we manage our water resources. Scientists and policy makers have a joint responsibility to work together in the development of more sustainable solutions to existing and emerging water problems. This policy brief aims to highlight the integrated and coordinated nature of the response needed to fully incorporate water into the new green economies of the world.

Rio+20 Policy Briefs

One of nine policy briefs produced by the scientific community to inform the United Nations Conference on Sustainable Development (Rio+20). These briefs were commissioned by the international conference *Planet Under Pressure: New Knowledge Towards Solutions* (www.planetunderpressure2012.net).



Summary of key points and policy recommendations

- Water must be given the prominence it deserves on the global agenda; the future should be viewed through a 'water lens'.
- Finding sustainable solutions for water problems is a joint obligation for science and policy; however science cannot solve the water crisis without societal engagement and political will.
- Human and environmental water needs must be balanced to safeguard biodiversity and ecosystem services. Unavoidable compromises should be mediated by science rather than lobbies.
- Water security has multiple dimensions, including social, humanitarian, economic and ecological. Major decisions on water resource management must be made therefore with broad cross-sectoral input.
- There is a need to improve the availability of data and information, particularly on transboundary water resources and planetary thresholds. We need to evaluate our water needs and prioritize allocations.
- Water-related climate change adaptation should be an integral part of water resources management plans (and vice versa).
- There is a need for greater stakeholder participation and collective action.
- Urbanization can be interpreted as an opportunity, rather than a risk.
- There is a need to introduce and implement strong policy and legal frameworks (i.e. water laws).
- Proper finance mechanisms are required to ensure sustainability of water services, while capacity building is required at all levels.



RIO+20
United Nations Conference
on Sustainable Development

THE WATER SECURITY CHALLENGE

Water security “means ensuring that freshwater, coastal and related ecosystems are protected and improved; that sustainable development and political stability are promoted, that every person has access to enough safe water at an affordable cost to lead a healthy and productive life, and that the vulnerable are protected from the risks of water-related hazards.”

Ministerial Declaration of the 2nd World Water Forum, 2000

Large parts of the world are already experiencing significant water shortage or stress, and the situation is likely to worsen as global populations, economies and consumption rates continue to grow. Furthermore, we are changing the global water system in significant ways, without adequate knowledge of the system and how it responds to change.

During the past century, the global population has tripled, but our use of water has increased six-fold. At the same time, the quality of available water resources has been degraded through human activities, including the excessive use of agrochemicals and the release of untreated sewage and industrial wastewater. Future water demands will need to be satisfied from a resource that has a more uncertain and variable occurrence, both temporally and spatially. Climate change is already changing precipitation patterns, with increased risk of droughts and floods and changes in the seasonality of runoff. Global warming is causing glaciers to melt, which has enormous implications for many major river systems. Furthermore, while dams are essential for generating power, storing water and controlling

flooding, they also trap sediments and lead to subsidence and erosion of productive deltas. Meanwhile, water is being pumped from coastal aquifers and groundwater sources faster than it is being replenished, a practice that is clearly unsustainable.

Global awareness of the need for urgent action on water security has grown markedly over the past 20 years but there is a long history of complacency to overcome. Water underlies a wide range of economic, environmental, social and political issues, including agriculture, energy, urban development, finance, trade and national security. Yet water has been consistently underpriced, being overused and wasted as a result. The worsening water security situation is beginning to affect the world's food and energy systems, with the greatest impacts on the poorest and most vulnerable parts of the world. The high rate of aquatic biodiversity loss and the links between water and land use are additional major challenges that must be addressed in our quest for sustainable development.

Unless action is taken now, water insecurity is likely to become a key geopolitical issue that affects the entire global economic system.

In addition to its economic value, water also has strong social, cultural and religious dimensions, being regarded as a basic human right and connecting humans intrinsically to the natural environment. Furthermore, water security is essential for achievement of many of the Millennium Development Goals. Water therefore overlaps many different aspects of policymaking.

To ensure sustained food security, economic growth and political stability in the future, water must be managed better. This will require government engagement and commitment as well as stakeholder participation at all levels.

While scientists can provide the knowledge, information and technical solutions that are needed, governments must lead the way in setting frameworks for improved water management and many other stakeholders have to be involved in delivering action and solutions. Furthermore, water should remain at the top of the global political agenda, with the future being viewed through a 'water lens'.

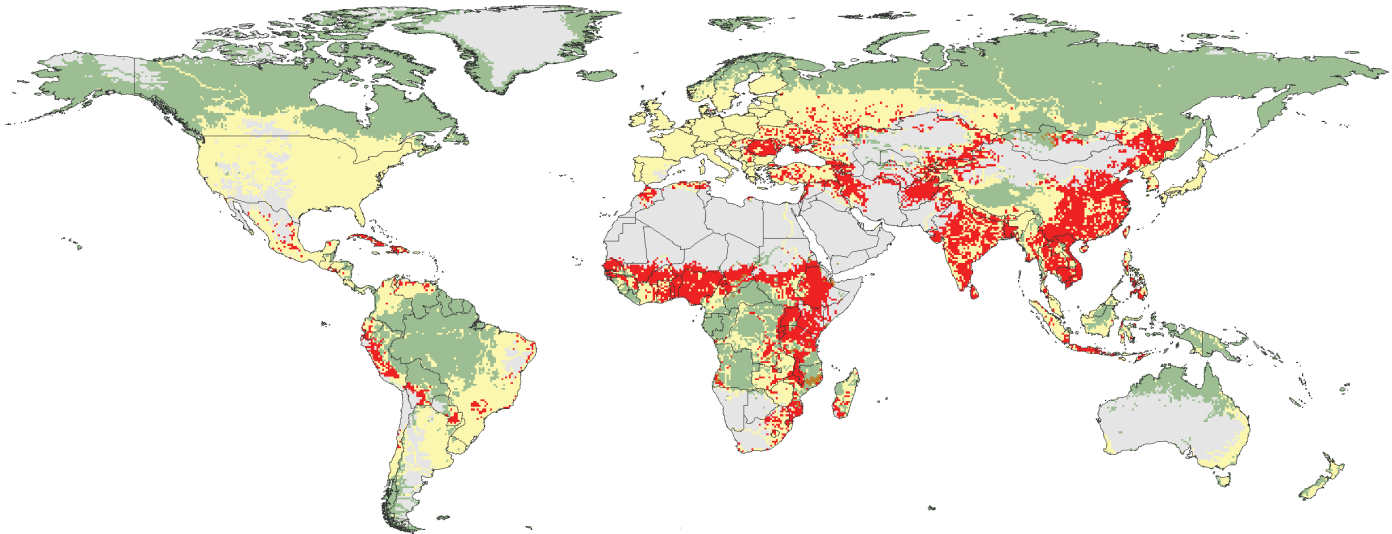


Figure 1. Areas of greatest threat to water security and biodiversity

Biodiversity threat: Low High Low High

Human water scarcity threat: Low Low High High

Source: Vörösmarty et al., 2010

WORKING FOR A SUSTAINABLE 'WATER WORLD'

*"There is still enough water for all of us –
but only so long as we keep it clean,
use it more wisely, and share it fairly"*

Ban Ki-moon, United Nations
Secretary-General, 2008

The United Nations Conference on Sustainable Development (Rio+20) provides a unique opportunity to strengthen commitment from the international community and national governments to promote and implement a more integrated and sustainable approach to the management of water resources. It builds on the commitment to action

emerging from Rio in 1992 (Chapter 18 of Agenda 21) and Johannesburg in 2002 (the Johannesburg Plan of Implementation). The 'green economy' is a major theme at Rio+20 and the summit will focus greater attention on balancing human and environmental water needs to safeguard biodiversity and ecosystem services while promoting economic development.

Water security: the main issues

The Ministerial Declaration at the 2nd World Water Forum in 2000 was the first inter-governmental pronouncement on water security and listed seven 'main challenges' to achieving water security:

1. Meeting basic needs
2. Securing the food supply
3. Protecting ecosystems
4. Sharing water resources
5. Managing risks
6. Valuing water
7. Governing water wisely

ENSURING WATER SECURITY FOR ALL



PHOTO: ISTOCKPHOTO/BRITTA KASHOLM-TENGVE

Attaining water security depends on maintaining a functioning hydrological cycle, implementing reliable engineering schemes, developing awareness of threats and mitigation plans, and formulating legal interventions, sensible policies and effective governance systems. Society as a whole must be willing to change.

To gain a comprehensive view of water security, decision makers need to take into account the needs of all the sectors that use water. Water is unique in that it connects natural and social systems, and no sector can be managed without giving consideration to water. Currently, around 70% of global freshwater withdrawals are used for agriculture, but the sector is highly inefficient. A large part of the green economy focuses on more sustainable agricultural development. The world needs to grow more food, but using less water, and farmers need incentives to invest in more water-efficient production technologies.

In addition to the water needs of agriculture, those of the industry, energy and domestic sectors are likely to grow in the coming decades. Governments therefore must

recognize the need to link the entire spectrum of related national policy issues. Better data and information, particularly on transboundary issues, are needed to facilitate cross-sectoral decision making, with trade-offs being assessed on scientific evidence rather than influenced by lobbying and pressure groups. Food security should not be traded against energy security. Even 'green' hydropower generation has potential impacts on freshwater ecosystems and science-based participatory compromises may be required.

Water is not yet given sufficient consideration in the climate change mitigation and adaptation debate. Water-related climate change adaptation should be an integral part of water resources management plans and vice versa: no climate adaptation plan should be drafted without explicit consideration of water. The capacity of local institutions must be built to address climate change adaptation as part of the water security agenda in development planning and decision-making processes, in line with national development priorities.

We are facing the possibility of pushing the planet beyond its carrying capacity unless development

and resource-use paradigms are revised fundamentally to encompass the principles of precaution, equity and sustainability. We need good interdisciplinary science, but also water governance and management practice based on 'water ethics' and compassion to secure water for humans and ecosystems.

What is IWRM?

Integrated water resources management (IWRM) is a process that promotes the coordinated development and management of water, land and related resources in order to maximize economic and social welfare without compromising the sustainability of ecosystems and the environment. It is internationally acknowledged as the way forward in dealing with issues of water security, and is in strong alignment with initiatives aimed at 'greening the economy'. However, IWRM will not deliver the expected results unless it is supported by strong political will, a flexible policy framework, strong institutions and an inclusive approach.



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FOCUS ON FINANCE, GOVERNANCE AND CAPACITY

PROMOTING PARTICIPATION

Water resources management plans must be developed with full stakeholder participation to build a sense of ownership in and commitment to the implementation phase. This is particularly important when considering upstream and downstream water users and transboundary water resources. Participation in decision-making is also vital in conflict resolution.

In little over a generation, two-thirds of the global population will live in towns and cities, with much of the increase occurring in the inner city slums and squatter settlements of the developing world. While huge challenges are posed by unregulated urbanization, cities may provide opportunities for making improvements. Concentrations of people and wealth in urban spaces enable the deployment of efficient technical solutions that may be unaffordable elsewhere.

The water crisis is often described as a crisis of governance – at both local and international levels. However, despite global recognition of the need for improved governance, two-thirds of the world's major river basins have no international treaties to govern their use, while most of Africa's transboundary water resources lack effective institutional arrangements. Research comparing frameworks from around the world indicates that the most essential features of good governance include polycentric governance structures, effective legal frameworks, reduction of inequality, open access to information and meaningful stakeholder participation. It is important to avoid the immediate application of so-called 'panaceas'.

A transparent, credible and responsive legal framework for water is vital to achieving water security. It provides a clear system for addressing specific issues of shared water development and management, identifying legal rights and obligations in water use as well as resource management and development. Furthermore, water laws ensure compliance and help resolve disputes. Transboundary water issues are a common cause of disagreement and conflict but, with good governance and stakeholder participation, they can act as a unifying force. Worldwide,

there are at least 300 international water agreements, often among parties that are otherwise at odds. These agreements demonstrate the potential of shared water resources to foster trust and promote peace.

Funding for water and sanitation has been beset by problems for many years, partly because many governments have built political support by subsidising the true cost of water supplies (e.g., irrigation has been heavily subsidised in India). Furthermore, the broad cross-sectoral nature of water supply complicates the issue and perpetuates a situation in which water services are priced below economic levels and the sector remains chronically under-financed. However, with good governance, financially viable water undertakings are in evidence in parts of the world, and these are attracting additional finance from sources other than government and donors.

Finally, capacity building is needed for all levels of water management, from high-level decision-makers, through water managers, implementers and technical personnel (who are often the main policy makers) to members of civil society, non-governmental organizations and water user groups. Furthermore, at the local level, there is a lack of capacity to introduce a more integrated approach to water resources management.

DEVELOPING A JOINT RESPONSE

There is no simple route to attaining water security in the future. However it is clear that those involved in developing solutions must have a good grasp of the complexities, different roles and intricate feedback mechanisms involved in the global water system.

To ensure a sustainable approach to water management, it is not sufficient to document the physical,

biological and chemical aspects of the hydrological cycle and develop technical options to create more equitable access to water. We also need to understand the social and political dynamics as well as the aspirations, beliefs and values that affect human behaviour relating to water use. Solutions for a sustainable 'water world' will be founded on interdisciplinary science but will need the involvement of all stakeholders. This presents a considerable challenge but is the only viable way ahead.



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