

The Future of Global Water Governance

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Abstract: Existing global water problems are likely to increase in severity over time and current governance approaches may not be able to address the severity of the problems. This paper inquires into the relationship between global water institutional structures, with particular emphasis on those involving the UN, and their possible outcomes in terms of addressing the impending water crises. It does so through developing story lines of possible water futures building on existing scenarios developed by the Intergovernmental Panel on Climate Change, the Millennium Ecosystem Assessment, and the Global Environment Outlook. These story lines are meant to help define the problems we are going to face, which global water governance institutions will have to address in the future. This will provide a general background for presenting the key institutional options for enhancing the governance necessary to address such water problems. These options include a high level advisory group, coordination mechanisms, a framework water treaty, and a single, global water organization. These four options are rather archetypal in nature and may neither capture the full spectrum of identifiable options nor be mutually exclusive. Hence, in a third step, the paper examines which institutional architectures may tend to facilitate achieving specific future outcomes, building upon the earlier steps of the analysis. The analysis takes different disciplinary rationales into account and backcasts from different futures to the current day to suggest why certain possible institutional structures might be more conducive toward realizing one possible future than another.

1. Introduction

Existing water institutional structures are either failing to address water challenges or are poorly equipped to cope with increasing pressure on water resources and the governance systems handling these resources. Different institutions are competing for leadership on water governance issues, which may already lead to duplications, contradictions, and inefficiencies. In this paper, I undertake an inquiry into the relation between global water institutional structures, with particular emphasis on the UN, and possible outcomes in terms of addressing impending water crises. I first discuss the key problems for global-level water governance and outline the trends in that governance, with a particular focus on the role that UN organs can play. I then present stories of what the world of water and water governance are likely to

look like in 40 years and through this seek to identify the common challenges to water governance that could be suitably addressed at the global level and the possible institutional and legal responses to these challenges. I then analyze and compare these possible responses with a particular view to their compatibility with achieving one or another of the possible futures. Through these analyses, I shall suggest what might be the preferred strategy to get us to one or another of the possible futures.

2. Stories of possible water futures

No one can predict with certainty what the water future of the planet will be. While climate disruption certainly is occurring, what its effects will be—how fast it will proceed, what will be its effects on specific regions of the planet, and how effectively nations and communities will mitigate or adapt to climate disruption—remain uncertain (Parry *et al.* 2007). As a result of these uncertainties, the Millennium Ecosystem Assessment (MEA 2005), the Intergovernmental Panel on Climate Change (IPCC 2007, 2010) and the Fourth Global Environment Outlook (UNEP 2007) have developed different scenarios developed. The Panel defined scenarios as “plausible descriptions, without ascribed likelihoods, of possible future states of the world,” while a storylines are “qualitative, internally consistent narratives of how the future may evolve, which often underpin quantitative projections of future change that, together with the storyline, constitute the scenario (Parry *et al.* 2007, p. 32). A brief look at these scenarios will explain the challenges likely facing humankind over the next 50 years.

2.1 Storylines in scenarios of reactions to climate disruption

The Intergovernmental Panel on Climate Change has developed a series of scenarios setting out possible water futures and scenarios for possible futures for other resources. Recognizing that major impacts are already occurring on the water resources and ecosystems of the planet (Parry *et al.* 2007, pp. 35-48), the Panel’s 2007 report on the likely impacts, necessary adaptations, and expected vulnerabilities of climate disruption set forth four scenarios, named A1, A2, B1 and B2 (pp. 22 endbox 3, 146-47). The storyline of the A1 scenario focuses on a future with rapid economic growth, and rapid introduction of technologies. It assumes that the global population will peak in the middle of the century and that there will be an increase in cultural and social interactions among people leading to convergence among regions. The A1 scenario is further subdivided along three paths depending on what energy sources predominate. The A2 scenario visualizes a heterogeneous world where countries and people focus on self-reliance and local identities. Regions develop differently and more slowly. In the B1 world, global population peaks as in the A1 scenario, but the regions converge towards a service and information society, there is a reduction in material intensity with a strong focus

on environmental impacts and governance that promotes sustainability and equity. The B2 scenario focuses on decentralized solutions emphasizing local routes to sustainable and equitable societies. It is a world with continuously but slowly increasing global population, intermediate levels of economic development, and less rapid and more diverse technological change.

The Millennium Ecosystem Assessment (MEA 2005) also identifies four scenarios, named Global Orchestration (which focuses both on sustainable development and fair trade with enhancement of global public goods and global education), Order from Strength (which focuses on conservation efforts such as reserves, regional trade blocks, security and protection and is highly regional in character), Adapting Mosaic (which focuses on local regional co-management and linking local communities to global communities), and Techno Garden (which emphasizes green technology, tradable rights, free movement of goods, technical expertise, etc.). The current Global Environment Outlook (UNEP 2007) also explores four scenarios. These are: Policy First (where governments, with active private and civic sector support, initiate and implement strong policies to improve the environment and human well-being, while still emphasizing economic development); Sustainability First (where governments, civil societies, and the private sector work collaboratively to improve the environment and human well-being, with a strong emphasis on equity); Security First (where the governmental and the private sectors compete for control in efforts to improve, or at least maintain, human well-being for mainly the rich and powerful in society); and Markets First (where the private sector, with active government support, pursues maximum economic growth as the best path to improve the environment and human well-being).

Regional climate changes are affecting many physical and biological systems, which in turn has already begun to affect some human systems, impacts that are only likely to grow larger (Parry *et al.* 2007, pp. 35-64, 79-117). This is particularly true of hydrology and water resources (Parry *et al.* 2007, pp. 173-210; UENP 2007, ch. 4). Yet each of these possible scenarios posits a future of increasing stress on water resources, with or without dramatic and continuing population increase. Each of the major storylines features a need to respond to growing water crises. In a sense, the problems are not as serious as the foregoing statements make it appear for the current strains on freshwater are in large part due to human activities ((Parry *et al.* 2007, pp. 48-50, 52-55, 71 box TS.7, 73, 75; UNEP 2007, pp. 119-22, 129-40). Constant changes in farming techniques, combined with urban and industrial growth, have seriously interfered with the availability of freshwater (UNEP 2007, pp. 133-35). Climate disruption, largely through its impact on the oceans, will affect rainfall patterns that will compound the effects of human activity, with rainfall becoming increasingly erratic, even

where it is increasing (Parry *et al.* 2007, pp. 177-78, 183, 186-87, 190, 192-93; UNEP 2007, p. 125-27). Arid regions will become wider and drier, while water management infrastructure will become effectively obsolete (Parry *et al.* 2007, pp. 175, 178-79, 185, 193-95, 223, 225-26, 249, 435, 439, 447-49, 451, 472, 477-78, 583, 585, 590, 596, 606-07). The melting of glaciers and the mountain snowpack will destroy these immense reservoirs of fresh water that provide the base flows of innumerable rivers during the dry months of the year, depriving vast regions of their summer water supplies (Parry *et al.* 2007, pp. 175-77, 179, 184, 187, 194, 337-83, 814-22; UNEP 2007, pp. 127-28).

Climate disruption also causes the spread of diseases into regions where formerly the disease agents could not survive (UNEP 2007, p. 127). In general, developing countries were found to be more vulnerable to the effects of climate disruption than were more developed countries (Parry *et al.* 2007, pp. 48-64), particularly because impacts on unmanaged systems (often more characteristic of developing countries) are more likely to be impacted than are managed systems (often characteristic of developed countries) (Parry *et al.* 2007, p. 48). Critical to this analysis is that the future vulnerability of communities or societies will depend on the developmental pathway each community or society follows (Parry *et al.* 2007, pp. 75-76)—which brings us back to the scenarios. These scenarios necessarily cover a good deal more than just water resources (Parry *et al.* 2007, pp. 146-61).

2.2 Governance options

The several scenarios adduced above describe plausible approaches to water governance problems likely to emerge in the next 50 to 100 years, providing templates for how to respond to the challenges of global climate disruption and other stresses affecting the management or use of water resources. These templates exist on a grid that ranges from governmental to non-governmental and from formal to informal. Most attention thus far has gone to governance options at the national or sub-national level that would be suitable to the challenges to water governance over the next 50 to 100 years. From such studies, the Intergovernmental Panel on Climate Change created a short list of issues that must be resolved in order to respond effectively to the coming challenges (McCarthy *et al.* 2001, pp. 222-23; *see also* Solanes & Jouravlev 2006; UNEP 2007, p. 141-42):

1. *The capacity of water-related institutions*, consisting of water agencies' authority to act, skilled personnel, the capability and authority to consider a wide range of alternatives (including but not limited to supply-side and demand-side interventions) in adapting to changed conditions, the capability and authority to use multi-objective planning and evaluation procedures in the assessment of policy alternatives, proce-

dures for conflict resolution, and incentives to analyze policies and projects to learn what worked.

2. *The legal framework for water administration* that always constrains, for better and for worse, the options that are open to water management; while laws change as needs change, changes are slow and lag changing needs. In many countries, the legal framework for water management is moving toward increasing environmental protection (e.g., the European Union's habitats directive).
3. *The wealth of nations* in terms of natural resources and ecosystems, human-created capital (especially in the form of water control systems), and human capital (including trained personnel) that determines what nations can "afford to commit" to adaptation, including, if necessary, the ability and willingness to transfer wealth among population groups and regions within a country and among nations.
4. *The state of technology* and the framework for the dissemination (or monopolization) of technology.
5. *The mobility of human populations* to change residential and work locations in response to severe climate events or climate change.
6. *The speed of climate disruption and the cumulative extent* of change affect the impacts on society in nonlinear fashions.
7. *The complexity of management arrangements* also may be a factor in response; in principle, the fewer agencies involved in water management, the easier it will be to implement an adaptation strategy (although the structure within the agencies will be very important), while if there are many stakeholders to involve—perhaps with conflicting requirements, management goals, and perceptions and each with some management control over part of the water system—it may be more difficult to adapt to changing circumstances.
8. *The ability of water managers to assess current resources and project future resources*, which requires continuing collection of data and the ability to use scenarios with hydrological models to estimate possible future conditions.

Drawing on the need to address these issues, the same report of the Intergovernmental Panel also described a set of tools required for successful adaptation to climate disruption (McCarthy *et al.* 2001, p. 226):

1. *Data monitoring*—adaptive water management requires reliable data on which to make decisions, calibrate models, and develop projections for the future, data covering not just hydrological characteristics but also indicators of water use.
2. *Understanding patterns of variability*—important for medium- and long-term water management; in particular, the stability of the “baseline” climate and recognition that even in the absence of climate disruption, the recent past may not be a reliable guide to the hydrological resource base of the near future.
3. *Analytical tools*—effective water management requires numerous tools to assess options and the future, including scenario analysis and risk analysis.
4. *Decision tools*—scenario and risk analysis must be supplemented with tools such as Bayesian and other decisionmaking tools to make decisions on the basis of the information provided.
5. *Management techniques*—techniques that are actually implemented to meet management objectives; a broad spectrum of techniques (such as building a reservoir or managing demand) is well known, but research is needed into specific aspects of many demand-side approaches, as well as into opportunities for seasonal flow forecasting and innovative water supply and treatment technologies (such as desalination) and to determine how to enhance the range of techniques considered by water managers.

Many of the issues are not yet being addressed effectively and the necessary tools may not exist in particular societies and communities. The scenarios, moreover, posit global governance responses that implicate global water governance and not just national or sub-national governance, yet global governance responses have received even less attention and implementation than governance at the national and sub-national level. In some respects, it is precisely at the global level that the differences between the several scenarios actually come into focus. While the following grid suggests some of the possibilities that need to be considered at all levels of governance, the remainder of this paper will focus on the global or transnational approaches to water governance, with particular emphasis on the possible role of the United Nations or its organs.

3. Key governance options in relation to the scenarios

The ostensible goal of global water governance today could be described as “water for all,” which is set forth in the Millennium Development Goals supplemented by the growing rec-

ognition of a human right to water and sanitation (United Nations 2000, 2010). And in today's world there are numerous transnational or international institutions for water governance that operate at the global or regional levels. These include highly formal institutions created under the auspices of the UN or other international organizations or by multilateral or bilateral treaties (Dellapenna 1994; UNEP 2007). They also include informal institutions created by water-oriented professional associations ("epistemic communities"), civil society groups, or market-place participants.

Existing institutions are relatively good at agenda setting, sharing information, mobilizing people, and, to a certain degree, in mobilizing resources. Yet although water has been on the agenda of many major summits, *e.g.*, at the Millennium Summit or Johannesburg 2002, it is only loosely institutionalized at the global level. Recommendations produced at such gatherings are full of good intent and widely shared principles, maybe some overarching norms, but are much weaker concerning (legally) binding rules and procedures or the provision of resources to implement the recommendations. Whether anything more is required reflects in large measure which of the several possible scenarios is selected as most desirable or at least as most likely. This section focuses on five archetypal global governance options. The overarching questions of analysis will be: Who does what best at which level? And, is one or another of these governance approaches conducive to moving towards one particular scenario or another?

3.1 A high level advisory group

Perhaps the simplest governance option would be to provide a high-level advisory group. Such a group could be a public institution or a private epistemic community, but it must be located high-up in the UN hierarchy or must have some source of authority. Either sort of group would serve to bring water governance functionaries together periodically to exchange information about water, water uses, and managerial practices. The group could operate globally, or within a particular region (such as a watershed), or between two nations. Examples would include the Global Water Partnership (Rana & Kelly 2004) or any number of groups sponsor river basin action plans. Another example would be the UN Secretary-General's Advisory Board on Water and Sanitation (created in 2004). While the Global Water Partnership was founded in 1996 by the World Bank, the UN Development Programme, and the Swedish International Development Cooperation Agency, it is funded by Canada, Denmark, the EU, Finland, France, Germany, the Netherlands, Norway, Sweden, Spain, Switzerland, the United Kingdom, and the United States. Wholly private or mixed public-private groups also exist, such as the various gatherings on a regular basis sponsored by one

or another epistemic community. The Gates Foundation or other private philanthropic groups might help cover the limited administrative expenses of such a group. Such approaches open doors without threatening anybody because the group has no formal authority and no money to dispense. An advisory group can talk with UNICEF, the World Bank, and other global or regional water governance institutions, while promoting diplomatic exchanges where appropriate. The Secretary-General's Advisory Board meets twice a year, with board members serving without pay but receiving reimbursement for travel and lodging. The Board also needs money for publishing pamphlets and to maintain a secretariat of three persons.

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3.2 Coordination agencies

A somewhat stronger option would be an institution charged with active coordination of the activities of operational institutions, whether bilaterally, regionally, or globally. Globally, the United Nations established an organization called UN Water in 2003 precisely to do this, at least as far as the numerous UN agencies responsible for water issues are concerned (UN-Water 2010). Today it coordinates the work of 31 cooperating agencies that in varying ways create or affect global water governance. It creates special task forces to address particular concerns, such as regional initiatives, the world water assessment program, the monitoring of sanitation and drinking water, gender and water, transboundary waters, and climate change and water.

Like the high-level advisory groups, UN Water or some other, hypothetical coordinating agency is not set up to make decisions or to set priorities. As a result, such an agency is un-

likely to be able to cope with projected increased water stress or to respond effectively to a changing environment. One possible response would be to create or strengthen the regulatory function of this institutional arrangement—perhaps through a strong reading of the term “coordination” in the UN-Water mandate. Some might question whether the problems are just too big and varied for a single coordinating agency to manage effectively. This argument gains strength in some scenarios relative to others. Some climate change issues are global and calls for a global response, which perhaps would justify stronger global coordination. Sanitation, on the other hand, is less of a global problem and perhaps would be better managed with minimal coordination. Pollution perhaps is somewhere in between.

3.3 A framework water treaty

There already are a large number of framework water treaties or directives, ranging from bilateral to multilateral to global (Dellapenna 1994). A framework treaty, as its name suggests, provides a broad set of principles around which interested nations or national legal systems can craft a specific legal regime to govern and constrain water management systems. In some ways, the most ambitious framework water treaty is the *UN Convention on the Law of Non-Navigational Uses of International Watercourses* (United Nations 1997). The Convention has still obtained only 21 of the necessary 35 ratifications (Salman 2007). The reasons for the slow pace of ratifications are open to debate, but may have to do with the relative inadequacy of the Convention. Its inadequacies are easily shown by comparing it to the International Law Association’s *Berlin Rules on Water Resources* (ILA 2004). The primary deficiencies are that the UN Convention addresses only transboundary issues and says rather little about concerns other than water sharing. While the Berlin Rules do address these and other issues neglected in the UN Convention, the Rules are unofficial and therefore do not have binding effect.

The European states have crafted two framework instruments that are much more comprehensive and detailed: the *Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (UNECE 1992); and the *Water Framework Directive* (EU 2000). The Helsinki Convention suffers from being limited to transboundary issues, but is more comprehensive and detailed. It also has a permanent secretariat, a meeting of the parties to keep the Convention up-to-date, and provisions for continuing research—all lacking in the UN Convention. The Water Framework Directive is highly detailed and is administered by (and could be updated by) the European Union’s organs, while also providing for continuing research. As frameworks, they still leave a considerable number to details to be worked out at the regional, national, or sub-national level.

Theoretically, the global community could replace the existing UN Convention (United Nations 1997) with a more comprehensive and detailed treaty, replete with a conference of the parties, a standing body for scientific and technical advice and so on. Or we could add a protocol on water to the UN Framework Convention on Climate Change (United Nations 1992). Too much detail at the global level, however, might actually be counterproductive if it prevented appropriate responses to local conditions. In any event, the governments of the world seem unwilling to commit to such a broad reaching alteration of global water governance given their reluctance thus far to ratify the less far-reaching UN Convention. That unwillingness might simply reflect a preference for a less centralized scenario.

3.4 A single water organization

Focusing on the reality that some water problems are global, the extreme of globalization of the response would be the creation of a single water organization that would address the full breadth and depth of at least some water problems. This is possibly even more hypothetical in nature than the idea of a new framework treaty or protocol. To do so would require the delineation of the functions it should address, the possible trade-offs that would be necessary to put it into operation, and how to overcome the gap between such an arrangement and current global water governance.

Consider, for example, if UN Water were to attempt to substantially extend its responsibilities and powers. If such a proposal were made, UN Water would almost certainly lose many of its members and their willingness to collaborate, but without any guarantee that the member states of the United Nations would agree to the proposed extension or to adequate funding for the necessary functions. If the General Assembly would propose an Intergovernmental Negotiating Committee to deal with water as it did in 1990 to deal with climate change, this could lead to a series of steps in this direction.

3.5 Markets

One popular solution would be to rely on markets for water management (Griffin 2006). After all, when people—even poor people—can see a real benefit from something, they are willing to pay for it. Consider, for example, how readily cellphones have spread even into the poorest communities, with little or no government involvement. Public private cooperation in the area of water services became increasingly important in the 1990s and water has increasingly been seen as an economic good in line with the Dublin Declaration (1992). Experiences along these lines have been mixed at best. Increasing international arbitration on water (Schouten & Schwartz 2006) and the difficulties in reconciling the

newly adopted human right to water and sanitation within the General Assembly and the treatment of water as an economic good (Agyenim 2010) are raising questions about whether water resources are suitable for market solutions—a question that is hotly debated (Rothfeder 2001). At best, markets can solve some water management problems on the small scale, but they will be of limited or no utility at the global scale (Dellapenna 2008).

4. Comparative analysis—from governance options to water scenarios

If one wanted to select among the foregoing global governance options, one should first ask what scenario of a water future one would like to achieve. Then one can reason back and ask which option, or what mix of options, would be most conducive to achieving the selected scenario. Space allows only a cursory consideration of that question.

Several scenarios emphasize the preservation of local identities or control. These include the Intergovernmental Panel's A2, the Millennium Environmental Assessment's Order through Strength, and perhaps the Global Environment Outlook. While those who prefer these scenarios cannot completely ignore the global dimensions of their water futures, they will prefer the less centralizing global governance options. These people are likely to prefer a high-level advisory group, or perhaps a fairly weak framework treaty such as the *UN Convention on the Law of Non-Navigational Uses of International Watercourses* (United Nations 1997). They might also like markets to the extent that they can be made to serve, although one could go with the high-level advisory group or a framework treaty without recourse to markets.

Two of the Millennium Environmental Assessment scenarios specifically emphasize markets: Global Orchestration and Techno Garden. Predictably, those who prefer these scenarios will support the market option for global water governance. Even for those scenarios, however, something more will be required for markets cannot resolve all questions of global water governance. The people are also likely to select a high-level advisory body or a fairly weak framework treaty, although some might prefer a stronger coordinating body or a more strongly developed framework treaty. The precise choice would turn on the degree of one's confidence in the need for more or less regulation of the market.

Those who believe that our water future would be best served by strong global growth—whether in terms of industrial and agricultural production (A1) or information services

(B1)—would probably prefer the strongest option (a single global water agency), but might have to settle for a coordinating agency or a highly developed framework treaty. Markets could supplement this arrangement. Supporters of any of the Global Environment Outlook options except Markets First would probably also come out here.

5. Conclusion

Those considering developing governance strategies to respond to the emerging global water crises must first determine what sort of water future they would prefer. Then they must determine what sort of global governance option (or mix of options) would be most suitable for bringing about that future. Finally, they must pursue strategies that have a chance of bringing that option into effect. Strategies can include advocacy, arranging financing, law reform, and developing or supporting epistemic communities. Should they succeed in creating such institutions, they will need to follow through to see that they are properly implemented.

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