Thematic week: Water, a Unique Resource

Thematic Axis: Water Geopolitics

Title of Paper: The Challenges of Global Water Governance

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Abstract:

In recent years, the concept of governance has gained ground, in the context of water policy, related to the concept of sustainable development. Different levels of concern with water governance have been considered, namely the local, river basin, regional and global levels. Actually, in certain cases, the governance normally applied at the river basin level may be insufficient, making it necessary to try to reach a higher level, i. e. regional or even global. Effective global water governance will require an adequate legal and institutional setting which is not yet provided by the currently existent instruments. Considered from this perspective, water tends to assume the role of a geopolitical resource, similar to oil or mineral resources. And although this perspective has not, thus far, prevailed, there are signs that the current views may be changing.

Key words: Water governance levels, water and globalization, virtual water, water as a geopolitical resource

1. Water in a Changing World

Although freshwater comprises only around 2,5% of the total amount of water in the globe, its role in the hydrological cycle is crucial in conditioning the climatic system's energy exchanges and feedback mechanisms. In reality, water plays a central part in the functioning of the Earth's Global System – which, in essence, is made up of three interconnected components: water which, in its various states, is renewed through the hydrological system; biological species which use and transform the water in its interaction with the bio-geochemical cycles; and man, who through his activities and institutions, interacts with the environment and modifies it.

The recent acceleration in demographic growth and in the rise in has resulted in transformations in the Earth's Global System which should tend to become more marked in the future. The central issue is to know whether these global changes are simply the result of adding up several local changes or whether the process of transformation itself engenders synergies that give rise to ample transformations in the System. Our greater or weaker control over the forthcoming global changes will necessarily depend on a better understanding of how the Earth's Global System works, of its robustness and resilience and on man's ability to adapt to the new conditions that will prevail in future. The Earth's Global System must, therefore, be taken as a unified system, of which we must consider the physical, chemical, biological and anthropogenic components, as well as the feedback mechanisms among these components.

One should note that, recently, the rise in water use at a global scale has been considerably greater than the growth in population. The likely future increase in these trends and the predictable increase in population will lead to more and vaster regions of the Earth being subject to water stress and to the development of increasingly unsustainable water use situations. In the next four decades, the world will have to feed around 2500 million more people. In order to fill, at a reasonable level, the nutritional needs of this additional population, another 3000 litres of water per person and per day will be required. This is twenty times more than the average water per capita needed to fulfil domestic needs in developed countries and sixty times more than the basic water needs, internationally set at about 50 litres per person, per day.

Evidently, this vertiginous dynamic of change in the present world will have, for the Earth's Global System, consequences that are not easily predictable. Naturally, the water sector, an essential component in this system, will not be untouched by the changes.

Furthermore, an important aspect to consider is the relevance that, in this context of change, will be gained by agents which are external to the physical system of water, whose influence will tend to grow significantly in the coming decades. Among these are demographic evolution, globalization, economic development, the value of human capital, the development in the action of international and intergovernmental cooperation institutions, the prodigious evolution in the information and communication systems, and scientific and technological progress. All are aspects that those in charge of water management have largely ignored in defining and implementing water policies, although they are already affecting the future availability of water and its management.

One should perhaps linger a while to consider a brief perspective of the recent history of this issue.

First, one should note that just fifteen years ago, in the final declaration for the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 (UNCED, 1992), water was not clearly mentioned as a priority issue. Only in 1998 did water emerge as a crucial element in sustainable development, when the United Nations adopted, in its Commission of Sustainable Development, the text "Strategic Approaches to Freshwater Management" (CSD, 1988).

This changed emphasis was visible, mainly, in a new way of addressing water management, by giving relevance to the influence of political and institutional factors in water management. In the "International

Conference on Freshwater", held in Bonn in 2001 (FLEMENCS, 2001), the term "Water Governance" became a definite part of the vocabulary of water professionals.

Around the same period, Tony Allan, the creator of the term "virtual water" identified four paradigms that configured modern thought on water management (Allan, 2003a):

- the *paradigm of industrial modernity* (from the late 19th century), corresponding to the golden age of the "hydraulic mission" which long dominated both the western and the soviet societies;
- the *environmental paradigm* (starting in the 1960s), in which there was a consideration of environmental issues in water management policies, reflecting a growing environmental awareness;
- the *economic paradigm* (beginning in the 1990s), which valued the notion of water as an economic resource and was supported by international financial and development institutions, who attribute the inefficient use of the resource to the prevalence of inadequate water pricing systems;
- and the *political-institutional paradigm* (beginning around the year 2000), in which the present water crisis is thought to be the result not necessarily of water scarcity, but, fundamentally, of a crisis in water governance.

To these four paradigms a fifth may now be added, which could be called the *global paradigm*, which requires an analysis of the issues facing resources at a global scale, and in which the water situations in the various countries, regions or continents are no longer considered separately. In fact, these problems are significantly conditioned by aspects such as the demographic explosion, globalization, technological evolution and climate change.

In future, problems related to water at global, regional and local scales will tend to become increasingly complex, and the conditions of access to water increasingly unequal. Water will be more and more a key-issue for society and the new problems will inevitably act as catalysts for the search for innovative social, technological and governance solutions.

The main goal will be to ensure, as quickly as possible, that all human beings will have water of good quality in sufficient quantity, as well as adequate sanitation. But even with considerably intensified international aid and cooperation, such a task will always take a few decades.

Indeed, there is a recognition that water is an indispensable resource for the progress of many countries and, especially, for most of the developing countries. Similarly recognized is the difficulty of ensuring the investments necessary for the development of new hydrological resources projects and for the maintenance and management of existing projects. Today's solutions, yesterday's management practices and the day before's frames of reference no longer allow us to predict tomorrow's problems, to say nothing of their solutions.

Among the issues that require careful analysis are: the validation of the current water-management paradigms, questioning, as needed, conventional knowledge and practices; analysis of the current forms of management; the availability of reliable data; the identification of the technical and scientific knowledge that will be needed in order to analyze and resolve future water problems; and how these problems may be solved in economically efficient and socially equitable ways.

In fact, in order to face the coming problems of water, a cultural revolution is needed, in terms of the methodologies through which such problems are identified, analyzed and resolved. The challenge of the future will increasingly be that of increasing our ability to manage water and aquatic ecosystems giving consideration to the resilience both of social and ecological systems, within the context of the sustainable development we must adopt in the future.

2. Water Governance

Presently, there is a recognition that the efficient consideration of water problems in all their complexity and the implementation of an economically efficient, socially equitable and environmentally sustainable water resource management can only be achieved through good water resource governance.

In recent years, the concept of governance has gained ground, in the context of water policy, related to the concept of sustainable development. Good water governance is considered necessary to provide adequate consideration of water problems in all their complexity and to warrant efficient and equitable water use and management, ensuring economic, social and environmental sustainability. The author has provided elsewhere (Cunha, 2008) a comprehensive view of the development of the concept of water governance

Historically, the concept of water governance appeared for the first time in 2000, at the second World Water Forum in The Hague (WWC, 2000). But the Forum Declaration referred to *good water governance* as water resource management involving public interest and stakeholders' participation, which is a comparatively narrow definition. Only one year later, at the Bonn Freshwater Conference (FMENCNS, 2001), a preparatory meeting of the Johannesburg Summit of 2002, the concept of water governance was broadened, to include institutional reform, legal framework, equitable access and Integrated Water Resources Management.

In general, *governance* may be defined as one way in which traditions and institutions balance power in the administration of a country. According to the definition put forward by GWP (2002) and accepted by the United Nations (UNESCO, 2003), *water governance* refers to "the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society"

Water governance aims to define who has access to water and in which circumstances, how is water quality guaranteed and how are decisions taken in case of water scarcity. Water crises would thus be the result of inadequate governance, more than of actual water scarcity. As Rogers and Hall (2003) state, "governance relates to a broad social system of governing, which includes, but is not restricted to, the narrower perspective of *government* as the main decision-making political entity". The water sector, as part of the socio-economic system, is conditioned by general politics and is, thus, influenced by decisions that lie outside of the water sector. Water governance determines who gets which water, when and how, and establishes who has the right to water and to water services. The representation of various interests in water decision-making and the role of politics are important in the definition of governance dynamics.

Water governance is considered to have four different dimensions – social, economic, environmental and political - which have been identified by UNESCO (2006) in the following way:

- The **social dimension** points out the *equitable use* of water resources. Apart from being unevenly distributed in time and space, water is also unevenly distributed among various socio-economic strata of society, in both rural and urban areas. How water quantity and quality and related services are allocated and distributed has direct impacts on people's health, as well as on their livelihood opportunities.

- The **economic dimension** draws attention to the *efficient use* of water resources and to the role of water in overall economic growth. Prospects for aggressive poverty reduction and economic growth remain highly dependent on water and other natural resources. Studies have illustrated that per-capita incomes and the quality of governance are strongly positively correlated across countries.

- The **environmental dimension** shows that improved governance allows for enhanced *sustainable use* of water resources and ecosystem integrity. The sufficient flow of water of good quality is critical to maintaining ecosystem functions and services and sustaining groundwater aquifers, wetlands and other wildlife habitats.

- The **political dimension** points at granting water stakeholders and citizens at large *equal democratic opportunities* to influence and monitor political processes and outcomes. At both national and international levels, marginalized citizens, such as indigenous people, women and slum dwellers are rarely recognized as legitimate stakeholders in water related decision-making.

3. Levels of Concern with Water Governance

Recently, the concept of water governance has grown in importance, evolving from a not very relevant idea in North-South cooperation dialogue to a respected concept with good acceptance at international, national and local levels. The observation of water problems from a perspective of governance has progressively led to the widening of the water agenda, so as to include the consideration of democratization processes, corruption and power imbalances between poor and rich countries and between rich and poor people.

Different levels of concern with water governance have been considered, namely the *local level*, taking in consideration local needs and stakeholder's views, the *river basin level* emphasising the importance of natural water boundaries for an efficient water governance, the *regional level* encompassing several river basins in a given region, in order to take in consideration national perspectives and/or land use planning, and the *global level* which points out the importance of considering long distance impacts on water availability and consumption. The relationships between these three levels of governance and a definition of how these relations can be used to strengthen the adaptive capacity and the resilience of water systems are deserving some attention.

Only recently has global water governance started to attract the interest, not only of natural scientists and engineers, but of social scientists as well. Effective global water governance will require an adequate legal and institutional setting which is not yet provided by the currently existent instruments.

The main arguments for the consideration of global water governance are the following:

-the hydrological cycle and its interactions with other biogeochemical cycles develop at a global scale

-many socio-economic impacts of regional water use may be felt globally, e.g. those related to climate change, to the global distribution of food products, to global pharmacy industry or to global security

-socio-economic globalisation may generate world wide conditions that fall out of the national control by individual states and drive water problems beyond the boundaries of regional water governance.

Since 1997, the World Water Council began to organise, every three years, a Word Water Forum. The second Forum approved a "world water vision", which, in a certain way, expressed a concern with global water governance. But after this, in the following two *fora*, such a global perspective declined. This is well expressed by the general theme of the last forum in Mexico City, "Local Action for a Global Challenge". Here, clearly the term "global challenge" is used as a repetition or an addition of local problems, rather than as a true global challenge in which the water problems generated are not necessarily suffered by those who have caused them.

As regards global international law related to freshwater, one can point to the "UN Convention on the Law of the non Navigable Uses of International Watercourses" (UN, 1997) and the "UNECE Convention on Protection and Use of Transboundary Watercourses and International Lakes" (UNECE, 1992).The latter can, in a certain way, be considered global, because, though prepared and approved only by states of the Economic Commission for Europe, it is open for signature by any state. A different situation, for example, is the case of the important Framework Water Directive of the European Union, which is an international legal instrument in the sense that it compels several states, but is not a global instrument, as only the EU Member States are involved.

A reference is also due to the Millennium Development Goals (MDGs) as a comprehensive United Nations initiative with strong implications regarding water. In September, 2000, 189 UN Member States adopted the Millennium Declaration (UN, 2000), which set eight goals, the so called MDGs, aimed to eradicate poverty in the world, and defined targets related to each of the goals to be achieved by 2015. Water has an important presence in the MDGs, not only because one target directly focuses on water, but also because water is indirectly related to the accomplishment of most of the other MDGs.

The goal more directly related to water is Goal 7, entitled "Ensure Environmental Stability", which breaks down into three quantitative targets: (i) integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources; (ii) reduce by half the proportion of people without sustainable access to drinking water and adequate sanitation; (iii) achieve significant improvement in the lives of at least 100 million slum dwellers. It should be noted that the reference to sanitation in target (ii) was actually added at the UN Summit on Sustainable Development held in September 2002 in Johannesburg, thus recognizing the close relationship between water supply and sanitation.

The goals set by the United Nations pertaining to water supply and sanitation have proven to be, not only insufficiently ambitious, but also, in a sense, a failure as far as their effective implementation. In 1980, following the Water Conference of Mar del Plata, the UN launched the Water Supply and Sanitation Decade, with the goal of, within 10 years, ensuring access to safe water and proper sanitation to the entirety of the world's population. Twenty years later, in 2000, with over 1100 million people lacking water supply and over 2500 million without sanitation, the MDGs proposed the reduction by 50%, within 15 years, of the world's population without water and sanitation.

Halfway through the MDGs' implementation period, one can already observe signs of a non-recoverable slippage in the goals pertaining to water and, especially, to sanitation. And, without wishing to be ironic, it seems acceptable to admit that, if in 1980 one expected, within 10 years, a 100% reduction in the population without water and sanitation, and in 2000, one expected, within 15 years, a 50% reduction, one might expect that in 2020 a plan might be approved that proposes to reduce the population without proper water supply and sanitation by 25% within 20 years.

According to the most recent assessments (e.g. WHO/UNICEF, 2006 and DFID, 2006), progress to date for the water and sanitation component of the MDGs is patchy, with particular concern for water supply targets in sub-Saharan Africa and Eastern Asia and concern everywhere for sanitation targets. The global sanitation target is actually expected to be missed by one-half billion people based on current trends. There are also wide disparities between rural and urban areas. For instance, concerning water supply, city dwellers are twice as likely to have access to safe water as those living in rural areas. If the current trend persists, 1.7 billion rural dwellers will still not have access to improved sanitation by 2015.

4. Towards Global Water Governance?

The river basin level is generally accepted as the natural frame of reference for the consideration and resolution of water problems, through the actions of planning and management considered as part of

water governance. Clearly the local level is not normally sufficient, as upstream-downstream relations condition most of the water issues and involve both water quantity and quality aspects.

On the other hand, it is always considered that water governance must be part of general governance, which deals with objectives and practices of the societal organization as a whole.

The relationship of water governance with the governance of the various sectors of society, in harmony with a general governance of that society may imply, and in certain cases does imply, consideration of a level of governance above the one of the level of river basins. In other words, in certain cases, the governance applied at the river basin level may be insufficient, making it necessary, perhaps, to try to reach a higher level, i. e. regional or even global.

Hoekstra (2006) undertook an interesting analysis of this issue, identifying nine reasons that may make it desirable to consider water problems at a global level, capable of ensuring the best solutions for the lower levels, i.e. the river basin and the local levels. The above mentioned reasons are listed below, followed by a short commentary concerning each of the nine (Hoekstra 2006):

- *Local issues of water scarcity and flooding will be enhanced or weakened by human-induced global climate change*. Good governance of local water systems can thus be hampered or impaired by mechanisms that go beyond the governance domain of water managers, who operate at the local, national or river basin level.

- *Local problems of water pollution are often intrinsic to the structure of the global economy*. Overexploitation of soil in some places, excessive use of fertilizers in other, long distance transfers of food and animal feed and concentrated disposal of nutrient-rich wastes in densely populated areas of the world cause disturbances in the natural cycles of nutrients.

- *There is a growing presence of multinationals in the drinking water sector*. Questions such as whether water should be treated as a resource or a commodity and whether water should come under the regulations of the World Trade Organization or not, are nowadays hot topics at international water forums.

- *Several national governments are developing plans for large scale inter-basin water transfers*. The practice of inter-basin water-transfers is not recent, but the scale of current proposals in terms of volumes and transfer distances is greater than ever before. Institutional arrangements at supra-basin scale need to be in place in order to prevent lack of coordination in trading off different interests.

- *An increasing number of water-short countries seek to preserve their domestic water resources trough the import of water in virtual form*. The studies of international virtual water show that water should be regarded as a global resource (demand and supply match at global level), rather than as a river basin resource (demand and supply match within the basin). Effective governance of the world's water resources will require some type of coordination of the 'global water market', similar to the case of oil within OPEC.

- *Global trade in water-intensive commodities offers the opportunity of global water saving if this trade is from countries with high to countries with low water productivity*. Water use efficiency at the global level can be increased if nations use their comparative advantage or disadvantage in terms of water availability to encourage or discourage the use of domestic water resources for producing export commodities. Virtual water trade between nations, from places with high water productivity to places with low productivity, can thus be a means of increasing the efficiency of water use in the world.

- *The water footprints of individual people are increasingly externalised to other parts of the world, so that many local water problems are strongly related to consumption elsewhere*. The

distance between production and consumption and the fact that much of the consumer information on product origin and characteristics is generally limited, at best, to information about the country of origin and the main ingredients, mean that there is a disconnection between consumption decisions and detrimental impacts of production. Consumption can only be reconnected with the effects of production through a global approach.

- *Some people around the world have comparatively high water footprints, which raises the question of whether this is fair and sustainable.* Redistribution of welfare among individuals is normally done, within the borders of the nations, but since the distribution of water and water-intensive products is very uneven across the globe, the redistributive question becomes a global one as well.

- *Due to its increasing scarcity and uneven distribution across the globe, water is gradually becoming a geopolitical resource, influencing the power of nations.* The political relevance of external water resources dependency of nations makes water a regional geopolitical resource in some river basins. The other type of dependency, virtual water import dependency, makes water a global geopolitical resource. The fundamental reason is the combination of increasing scarcity of water.

5. Water and Globalization

In recent years, the international trade of goods and services has been adopting new rules and procedures, reflecting an increasing influence of multinational firms. Further, this trade is materialized in international agreements with wide implications for consumers, governments and the environment. This leads to a global economy, characterized by an intensification of international trade, the whole process being referred to as globalization.

The relevance of globalization as regards water may be considered from two different perspectives. The first is related to the consequences of economic globalization on water resources management. The growing integration of the world economy is a source of certain dynamics which tend to escape national control by the states and can have negative impacts on water, in particular pertaining to water contamination and associated environmental degradation.

The second perspective is related to water, itself, as an object of globalization policies and may be materialized by the possible development of an international water trade. Some natural resources, such as oil, natural gas, wood, agricultural products or fish have, for a long time, been the object of international trade, without this being the source of particular problems. When it comes to the export and import of water, however, more expressive reactions tend to develop. It is often stated that water is different and, often, nationalistic feelings tend to emerge in relation to water export.

The international trade of certain resources, such as agricultural products, livestock, fossil fuels, fish and wood always involves a certain degree of processing. Other resources, such as crude oil, wood logs or raw fish involve a much smaller degree of processing at the point of origin. Water can, in some cases, be considered as a raw good and, in others, as a product with high added value. Bottled water, for instance, is a product with significant added value, the international trade of which has been growing considerably in several regions. The international trade of water is, then, made according to the rules of international trade, like any other product.

In fact, most of the controversy and concern around proposals of water globalization are related to the trade of raw water across national borders. Nevertheless, one form of 'trade', normally accepted without raising special problems, is the natural flow of water between countries sharing a river basin. This transaction is normally ruled by political agreements, rather than commercial trading agreements

In practice, only a comparatively small number of agreements for long distance trade of raw water have been celebrated. The international trade of raw water is normally made through pipes or canals or by transporting water in tankers or large plastic bags, called 'medusa bags', towed by a boat. The transport of water by towing icebergs wrapped in plastic bags from polar regions has also been proposed, but never put into practice. These forms of water transfer are normally expensive and not competitive with more usual practices such as desalination.

6. Virtual Water and Global Water Governance

One form of water transfer between countries or regions which has recently become the object of a growing interest is the 'transfer' of the water used in the production of goods traded by countries or regions. Tony Allan was the first to name this "virtual water" (Allan 2003b), and the concept was later treated and developed by several researchers. The term "virtual" is meant to call attention to the fact that most of the water used in production is not, in fact, incorporated in the product. The water linked to the production and processing of food is particularly significant when taking stock of virtual water transactions, but the amount of virtual water used in the production of various foods is quite variable, depending on the product and on the conditions under which it is produced. As an example, the virtual water associated with producing 1 kg of wheat averages 1300 liters, whereas 1 kg of coffee uses an average of 21 000 liters, 1 kg of chicken 4000 liters, and 1 kg of beef 15 000 liters.

When taking stock of a country's water, one generally speaks of the amount of water generated by rainfall in that country and the amount of water, both surface and groundwater, that flows in from neighbouring countries. But if this balance is to include virtual water, then imports and exports of virtual water must also be accounted for.

Similarly, when speaking of a country or region's water dependency, one usually considers, aside from endogenous rainfall, only the amount of incoming water from upstream through rivers or aquifers and the amount of water that flows away downstream. However, adopting a global governance perspective, one must also consider the virtual water imported and exported by the country or region in question. in consideration.

Taking into account external dependency in terms of virtual water gives a reinforced significance to global water governance, since many countries with greater water shortages may be the source of large imports of virtual water from other countries.

Considered from this perspective, water tends to assume the role of a geopolitical resource, similar to oil or mineral resources. And although this perspective has not, thus far, prevailed, there are signs that the current views may be changing.

In proposing global water governance, the current issue of climate change and its impacts upon a variety of socio economic sectors is particularly important. Water is known to play a relevant role as a mediator of those impacts, as a result of its unique character as a resource which is transversal to the different sectors of socio-economic activity.

As is also widely known, the attempts to control the impacts of climate change have involved two complimentary forms of action, the mitigation of the sources of global warming and the adaptation to the impacts suffered.

Some authors have underlined the privileged relationship of mitigation with energy production and of adaptation with water use. In reality, however, both forms of intervention are not independent of each other, for it is clear that several modes of energy production have important repercussions in the consumption of water and that the various modes of water use can have considerable effects upon the consumption of energy.

These changes in water footprints for energy production and in energy footprints for water development lead to the interaction between water policy and energy policy, which is simply an additional reason in favour of the consideration of a global water governance.

The acceptance of the benefits of thinking in terms of a global water governance capable of fomenting at the planetary level a more efficient, equitable and sustainable water use raises the issue of considering the establishment of a global framework at the level of the principles and measures to adopt in order to ease this global enforcement. Hoekstra addressed this global institutional framework, proposing, in an exploratory manner, a set of measures to be adopted in order to progressively facilitate the enforcement of global water governance.

In particularly he suggests (Hoekstra, 2006) the following: the adoption of minimum water rights, an issue which has already been addressed by a number of authors; the establishment of maximum allowable water footprints and of tradable water footprint permits, trying to condition, in a certain way, a reasonable share of the world water resources between nations and individuals; the adoption of a water label for water-intensive products, in order to make consumers aware of the hidden links between a consumer product and the impacts of production in the water systems; the adoption of a disposal tax for products related to water pollution costs, which should work as an incentive for production processes and consumption behaviour; and, finally, the establishment of a global agreement on an international protocol on water pricing, covering the full cost of water use, including investment, operational and maintenance costs, as well as environmental costs and scarcity costs.

Though preliminary, the present analysis will, at least, clear a path, perhaps allowing a progress, from a still somewhat utopian vision towards another that is growingly more substantiated.

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