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Sharing Water: Evolution, Threats and Challenges

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SHARING WATER: EVOLUTION, THREATS AND CHALLENGES

Water is currently on the political agenda of most, if not all, countries in the world. The reasons lay with the current water situation, which has become more acute with recent reports on the impacts of climate change over water resources availability and the predictions of water wars in the near future. This situation clearly begs the question of what is humankind going to do or, more accurately, what can humankind do to survive this situation. And the immediate answer is, since there is so far no substitute for water, it must be shared between the haves and the have-nots, between the water-rich regions and the water-poor ones. But sharing the water, as a principle, is easier said than done. There are a multitude of aspects influencing the decision to share water and the conditions of that sharing. I will draw on two paradoxes identified by Boaventura de Sousa Santos¹ concerning the current theoretical framework in relation to reality. Although in a much more restricted topic, the current water debate, in my opinion, fits perfectly into his analysis. The first paradox, the finitude of the infinite, captures clearly the change from the perception of water abundance, in general terms, to one of water scarcity worldwide. And the second paradox, the need of emergency associated with the dynamics of a civilizational transformation, which is everything but immediate, speaks to the challenges currently facing the water sector, as most other aspects of human life.

These two paradoxes will guide my discussion of the different contributions to the *Dossier* on “Water Sharing in Spain, Portugal and Morocco coordinated by Patrice Cressier and Fabienne Wateau². The authors engage in different aspects of water sharing that range from physical issues to political, social, economic and architectonic ones. Besides the overall theme of “sharing water”, all of them highlight different aspects of this “sharing”, which implicitly, and sometimes even explicitly, draws out the current political dynamics underlying the process of sharing water. They all bring out, independently of the time period they are analyzing, pertinent sharing, or better said, governing principles of water resources. Consequently, the two above identified paradoxes will be explained through the evolution of water governance models³ and each author’s contributions will be

¹ B. de Sousa SANTOS, “A filosofia à venda, a douda ignorância e a aposta de Pascal”, *Revista Crítica de Ciências Sociais* (Coimbra), 80, May 2008: 11-43.

² *Le partage de l'eau (Espagne, Portugal, Maroc). El reparto del agua (España, Portugal, Marruecos)*, P. Cressier & F. Wateau (eds), *Mélanges de la Casa de Velázquez* (Madrid), XXXVI (2), 2006, 383 p., ISBN : 84-95555-86-7.

³ J. ALLAN, “Water Resource Development and the Environment in the 20th Century: First the Taking, then the Putting Back.”, in J. Rodda & L. Ubertini (eds), *The Basis of Civilization – Water Science?*, Wallingford (Great Britain), International Association of Hydrological Sciences Press, 2004: 135-149; K. BAKKER, *An Uncooperative Commodity: Privatizing Water in England and Wales*, Oxford (Great Britain), Oxford University Press, 2003; P.D. LOPES, *Water with Borders: Social Goods, the Market and Mobilization*, Baltimore (USA), The Johns Hopkins University, PhD thesis, 2005.

discussed according to their relation to different aspects of those models, showing their relevance to the current water debate.

The end of abundance

Although Quintela and Mascarenhas state that, in Roman times in Portugal, when it came to the “sharing of responsibilities concerning investment and hydraulic equipment, [...] it [was] the private sphere that matter[ed]”⁴, water has actually been persistently excluded from the economic private sphere. For many, water is considered to be ‘God given’ or a ‘gift from nature’, just like air⁵, consequently not suitable to individual appropriation. Water sharing has evolved throughout the times, and even during the same period, several human settlements followed different sharing principles. Cressier shows us how, in al-Andalus and the Maghreb, during the Medieval Age, these principles of sharing were “a direct reflection of the segmented organization of the populations”⁶. He also highlights that sharing is in fact a specific aspect of managing, and, in my opinion, governing.

Hydraulic State Governance Model

Besides this general perception of water’s almost divinity, the natural and renewable character of water created a perception of abundance, which excluded its management from developing within a market framework. The combination of this primordial feeling and water’s perceived abundance precluded it from being treated as an economic good. As a result, and with the consolidation of the modern state, and also as a means contributing to its legitimization⁷, in general terms, since the eighteenth century, water has been typically considered a social good by society, and kept under state’s jurisdiction. The state became not only the designated but also the default actor governing water resources.

The various industrial revolutions – steam power (18th-19th centuries), mass production and automation (20th century) – combined with the agricultural revolutions – 18th century and the Green Revolution (1945 up to now) – dramatically increased the water demand for productive processes. The demographic revolution and urbanization further increased the pressure on fresh water resources. As a result, major infrastructures had to be built to divert water to new and growing urban centers. The acceleration and increased range of these processes have characterized most of the twentieth century, creating nowadays hydraulic societies.

⁴ A. QUINTELA & J. MASCARENHAS, “Barrages romains du Portugal. Types et fonctions”, *Le partage de l’eau . . .*, *op. cit.*: 30.

⁵ J. SOHNLE, *Le droit international des ressources en eau douce: solidarité contre souveraineté*, Paris (France), La documentation française, 2002: 13.

⁶ P. CRESSIER, “Géométrie des réseaux et marqueurs des territoires. L’image du partage de l’eau dans le paysage médiéval (Espagne et Maroc)”, *Le partage de l’eau . . .*, *op. cit.*: 50.

⁷ L. MORAL ITUARTE & R. SILVA PEREZ, “Grandes zonas regables y reparto del agua en España. El caso de la cuenca del Guadalquivir”, *Le partage de l’eau . . .*, *op. cit.*: 125-126.

All of the contributions show us different aspects of the creation⁸, consolidation⁹ and already questioning of our hydraulic societies¹⁰.

Water has been, therefore, governed within a hydraulic state governance model. This is despite some of the initial difficulties the state might have faced to consolidate its role. Cressier calls our attention to this aspect, illustrating how in the village of Ag'māt, still in medieval times, the fact that the State kept a share of the water was not consensually accepted. According to Cressier, "[t]his imposed sharing was never accepted except by force"¹¹. With the consolidation of the modern state, water was taken where needed, when needed. The overall aim was growth-oriented, focused on always increasing supply to face increasing demands and sustaining economic growth. Although in several parts of the world water has always been a scarce resource, this supply-side approach in many regions reinforced the perception of abundance. After all, water falls from the skies, and the planet's hydraulic cycle, as far as we know it, is closed, which implies that the quantity of water available in the world is always the same.

These considerations should be contextualized. Assessing water's resources in the planet is not an easy task: water can be saline or fresh and exist in liquid, solid or gaseous state. However, the most cited numbers, by Igor Shiklomanov¹², indicate that there is more than enough water in the world. The major problem is that, and according to Shiklomanov, 97.5% of the planet's water is saline and only 2.5% is actually fresh water. Furthermore, of these 2.5% of fresh water, 68.7% constitutes ice and permanent snow cover in the Antarctic, the Arctic and different mountainous regions across the world. The next 29.9% is groundwater, which is, in several cases, difficult and/or expensive to access. This scenario leaves us with mere 0.26% of the total amount of fresh water in the planet available in lakes, reservoirs and river basins.

The second problem is that water is often in the wrong place, at the wrong time, with the wrong quality. It is not evenly distributed across space or time, nor does it follow an absolutely predictable cycle, denoting changes in the places and times of rain fall. Consequently, the State, both as a means of legitimization and of participation in the modern progress, assumed the responsibility to take water to the right place, at the right time, with the right quality.

⁸ A. QUINTELA & J. MASCARENHAS, "Barrages romains . . .", *op. cit.*: 17-38; P. CRESSIER, "Géométrie des réseaux . . .", *op. cit.*: 39-59; T. MADANI, "Le partage de l'eau dans l'oasis de Figuig (Maroc oriental). Approche historique et archéologique", *Le partage de l'eau . . .*, *op. cit.*: 61-82.

⁹ T. MADANI, "Le partage de l'eau . . .", *op. cit.*: 61-82; G. LEMEUNIER, "Les maîtres de l'eau. Propriété et gestion hydraulique dans la Murcie moderne (v.1500-v.1800)", *Le partage de l'eau . . .*, *op. cit.*: 83-106; F. WATEAU, "Du préciput au partage égalitaire. Exemple portugais de transmission des droits d'eau de la fin du XIX^e siècle à nos jours (Melgaço, Alto Minho)", *Le partage de l'eau . . .*, *op. cit.*: 107-124.

¹⁰ L. MORAL ITUARTE & R. SILVA PEREZ, "Grandes zonas regables . . .", *op. cit.*: 125-147; S. CLARIMONT, "Partager les eaux de l'Èbre. La presse aragonaise contre les projets de transfert", *Le partage de l'eau . . .*, *op. cit.*: 149-170.

¹¹ P. CRESSIER, "Géométrie des réseaux . . .", *op. cit.*: 48.

¹² I. SHIKLOMANOV, "Appraisal and Assessment of World Water Resources", *Water International*, XV (1), 2000: 11-32.

Although this governance model did not require water to be a free good (in the economic sense, i.e., a good that is not scarce), it actually created that illusion. Many countries did not charge for water; others actually subsidized water¹³; all did their best to build reservoirs and to guarantee a continuous water supply to urban centers and major businesses. This was reinforced by the allocation principle that characterized this governance model: social equity. When people did have to pay for their water supply, charging was based on each citizen's ability to pay. Water was not only abundant, but vital, consequently, the State picked up the tab of those that could not afford to pay, when water was charged for. Water supply was considered a public service in the political-social sense of the issue. In other words, although water, economically speaking, is a private good¹⁴, due to its vital role in human life and its non-substitutability, water has been managed as a social or political public good.

Consequently, the basic governing principles, domestically, were universal provision of water and national solidarity. Everyone was entitled to water; no one could be excluded and if more water was needed, it should be provided. This was defined politically and socially and not because water was an economic public good. It followed that for these two principles to be guaranteed and implemented, the best positioned actor was the State, or some other level of public management, who had the power and legitimacy to decide where and when infrastructures were built, finance those infrastructures and aim at an even distribution of the resource within national boundaries. Clarimont discusses this solidarity from a riparian level to a national level in the Ebre river basin in Spain. And she states that all efforts were employed "to dominate nature, mobilize water, stock it, channel it in order to take it"¹⁵ where it was/is needed. Spain constitutes an international reference of a country where the hydraulic state governance model profoundly shaped the national physical scenery and determined the water policy of avoiding each drop of water from reaching the sea/ocean, since that was considered to be a wasted drop.

Within the hydraulic state governance model, the universal provision of water was accompanied by a tendency to define water resources as public property. Water resources public ownership is currently enshrined in country's national constitutions and/or legislations¹⁶. Several national constitutions define water, along

¹³ L. MORAL ITUARTE & R. SILVA PEREZ, "Grandes zonas regables . . .", *op. cit.*

¹⁴ An economic private good means its consumption is rival and excludable, i.e. one can physically prevent others from consuming water and one's consumption diminishes the amount of water available for others to consume. Whereas an economic public good means that a good's consumption is not rival or excludable. The classical examples are domestic security or a light house, and this is independently of the property rights regime associated with that good.

¹⁵ S. CLARIMONT, "Partager les eaux de l'Èbre . . .", *op. cit.*: 152.

¹⁶ It should be noted that many countries, until the Second World War, did not have an explicit legal definition of water property rights. Water either did not have a property rights system – *res nullius* – or was assumed to be under the general natural resources property rights system if one existed. The reasons underlying this change are not the object of this research, but the author believes that the confluence of environmental movements and the unprecedented emergence of numerous new democratic regimes created the conditions for new constitutions to include an explicit mention to water itself, and for older democratic regimes to enact legislation dedicated to natural resources and/or water.

with national soil, subsoil and all its natural riches, as belonging to the State, the nation or the government. Water resources are therefore public property. Most countries have adopted this definition, albeit with some nuances concerning the locus of property – federal state, states, provinces, regions, any other autonomous political entity, the people or nation – and the legal interpretation of public property¹⁷. In the case of civil law legal systems, water has been defined as public or private. This has created significant constraints on the states' attempt to efficiently manage water resources, due to the fact that "private water went with private land", specially underground water. As a result, countries such as France, Spain and Italy, have, in the last quarter of the twentieth century, enacted legislative reforms to bring all water resources under state ownership and made their use subject to administrative grant¹⁸. Under the common law system, water has maintained the *res communes* status defined by the Romans. "There can be no private ownership right in the running water of a stream, river or natural channel, as such water is regarded as transient and fugitive."¹⁹

This tendency to define water as a public or common "thing" is not exclusive to the legal systems derived from ancient Rome. The Chinese, for instance, have applied a "community approach" to water resources and water resources management. This approach has been confirmed by the 1988 Water Law, where water resources are defined as the property of the state, the property of the whole people (Article 9). Under the Soviet regime, and within the socialist framework, all waters were rather the exclusive property of the Union of Soviet Socialist Republics, therefore state property. In Muslim countries, the teachings of Prophet Mohammed have heavily influenced water management principles. The Prophet declared that the earth's resources should be shared, including water²⁰. And just like fire and grass, water, he stated, was a free good²¹ and a common entitlement of all Muslims²². The Prophet also prohibited the selling of water. Islamic water

¹⁷ Public property can be interpreted in one of three ways: people's or nation's property, which cannot be subject to any form of property; public property *per se*, which confers the state the right to manage water, but those rights cannot be disposed of; and private property of the state, which allows the state to act as any private economic actor. Popov, D., "Consideration on Current Issues in Contemporary Water Law", in *Regional Conference on Water Law: Legal Aspects of Sustainable Water Resources Management*, Teslic (Republic of Serbia, Bosnia and Herzegovina), 2001.

¹⁸ D. CAPONERA, "Existing Systems of Water Law in the World.", Paper presented at the *Regional Conference on Water Law: Legal Aspects of Sustainable Water Resources Management*, Teslic, Republic of Serbia, Bosnia and Herzegovina, 2001: 3.

¹⁹ *Ibid.* Although the United States have a common law system, and the *res communes* nature of water has strongly influenced the Eastern states, in some Western states, a different principle has been developed: the prior appropriation principle – the first to claim and use the water is entitled to it.

²⁰ F. CHATEL, *Prophet Mohammed: A Pioneer of the Environment*, 2003, available from <www.islamonline.net/english/Contemporary/2003/02/Article02.shtml> accessed February 14, 2005.

²¹ H. SHUVAL, "Sustainable Water Development under Conditions of Scarcity: Israel as a Study Case", in S. Marchisio, G. Tamburelli & L. Pecoraro (eds), *Sustainable Development and Management of Water Resources: A Legal Framework for the Mediterranean*, Rome, Institute for Legal Studies on the International Community – CNR, Mediterranean Sustainable Development Law – Mesdel, 1999: 197.

²² EMWIS, *Palestine: Institutional Framework of the Water Sector*, Euro-Mediterranean Information

law recognizes, in addition, two important water rights: the right of thirst and the right of irrigation²³.

Some of the contributions being analyzed here do address this aspect either implicitly or explicitly. Quintela and Mascarenhas refer to the importance of the private sector for water management and the necessary investments, although it is not clear if these dynamics are associated to explicit property rights. Cressier, addresses this issue explicitly as he discusses water management in medieval times in the Maghreb and the Iberian Peninsula. He highlights the fact that “the existence of complex sharing infrastructure is usually the sign of an effective autonomy of that water property”²⁴. Madani also addresses this issue explicitly, but he does recognize that despite the private nature of water rights in the Figuig oasis²⁵, there was an “eternal right” to bathe, wash and domestic use²⁶, which actually resembles the ‘right to thirst’ decreed by Prophet Mohammed. Lemeunier relates the union or division of water and land rights to the level of existing water scarcity. Where water is less scarce, water and land rights go hand-in-hand; but in water scarce regions, there is a tendency for water and land rights to be separated and for water rights to be sold, bought, donated, mortgages or even rented out²⁷. Wateau, with her study on water rights transfers throughout generations in a Portuguese region, Melgaço, shows us how water and land went together until the abolishment of the *morgadios*²⁸ in 1863. From then onwards, although not in a radical manner, there was the possibility of separating land and water rights. Finally, Clarimont does not address water rights *per se*, but her discussion of regional and national solidarity implicitly raises that issue. Riparian people did not really claim concrete property rights over the water, but they considered it ‘their’ water and believed they should have a saying in the decision-making process concerning the management and use of that water.

Neo-liberal Market Governance Model

In the last quarter of that century, the end of abundance is most acute, with water’s renewability being put into question by advancements in scientific knowledge. Some sources of water are not, after all, as renewable as previously thought. For example, it has been recently established that less than one per cent of the Great Lakes’ water is annually renewed²⁹. Also, many aquifers have not been able to

System on the know-how in the Water sector, 2005, available from <www.emwis-ps.org/institutions.htm> accessed February 14, 2005.

²³ *Ibid.*

²⁴ P. CRESSIER, “Géométrie des réseaux . . .”, *op. cit.*: 41.

²⁵ T. MADANI, “Le partage de l’eau dans l’oasis de Figuig . . .”, *op. cit.*: 77.

²⁶ *Ibid.*: 78.

²⁷ G. LEMEUNIER, “Les maîtres de l’eau . . .”, *op. cit.*: 85.

²⁸ A *morgadio* is “the group of goods, which cannot be sold or separated, attached to a noble title, transferred, with the title, to the oldest of a family”; these goods cannot be sold, exchanged, rented, mortgaged or donated or even used to pay debts (F. WATEAU, “Du préciput au partage égalitaire . . .”, *op. cit.*: 113).

²⁹ INTERNATIONAL JOINT COMMISSION, *Protection of the Waters of the Great Lakes – Final Report on the Governments of Canada and the United States*, Washington, D.C., Ottawa, 2000: 6. The Great Lakes hold around one fifth of the world’s fresh water resources (*Ibid.*: 1).

replenish due to the rate of human extraction being higher than the natural rate of replenishment, and, as a result, are on the verge of depletion or extreme pollution³⁰. In several regions of the world, the rate of human consumption has surpassed water's natural replenishment rate, creating a shortage, which strengthens the claim that a global water crisis is in the making. The perception of abundance has been dramatically changed: water has become to be perceived as a scarce resource.

This shift from perceiving water resources as abundant to realizing they were actually a scarce resource was accompanied by other market pressures towards the commodification of water itself. From the 1970s onwards, the costs of the hydraulic state governance model began to receive greater attention. A convergence of different factors led to this situation. On the one hand, the identification of a water crisis, due to its 'found' scarcity, along with an increase of environmental public consciousness determined the need for significant investments to manage, improve, extend and guarantee a sustainable and efficient water supply. On the other hand, the traditional provider, the state, claimed (and still claims) it did (does) not have the funds to satisfy the current demands. And, simultaneously, the economic paradigm shift that took place in the 1970s consolidated in the 1980s. From a policy paradigm where government was part of the solution, neo-liberal economics claimed government was part of the problem. The neo-liberal economic paradigm has (convincingly) presented private enterprise as "one of the most desirable methods of allocating resources, goods, and services"³¹. This desirability follows from the belief that "exclusive private property is thought to foster the well-being of the community, giving its members a medium in which resources are used, conserved and exchanged to their greatest advantage"³². Consequently, the negotiation of resource allocation should unfold under the auspices of the market. And, as a result, the water sector suffered a marketization³³ process. It comes as no surprise, then, that private economic actors became extremely interested in participating in such a vital and scarce resource's exploitation and management, both domestically and internationally.

It is in this context that, in January 1992, the World Meteorological Organization convened the International Conference on Water and the Environment in Dublin.

³⁰ The rate of extraction of water is higher than the rate of natural replenishment of aquifers. As the level of water decreases, the probability of pollution through infiltration and salinization increase.

³¹ F. TRELEASE, "Policies for Water Law: Property Rights, Economic Forces, and Public Regulation", *Natural Resources Journal* (University of New Mexico School of Law), V(1), May 1965: 6.

³² C. ROSE, "The Comedy of the Commons: Custom, Commerce, and Inherently Public Property", *University of Chicago Law Review*, 53, 1986: 712.

³³ Marketization, privatization and commodification are here considered as different processes, albeit related. Marketization is the process by which private actors are allowed to participate in a certain economic activity and prices are charged for the product in question. Privatization is the process by which an economic activity shifts into private hands. Commodification is the process by which something becomes a tradable good in the market. In my understanding, water privatization has never occurred. Water's property and services have never permanently shifted into private hands.

The outcome of this conference is known as the Dublin Statement, which was commended to the world leaders participating at the United Nations Conference on Environment and Development in Rio de Janeiro. The Dublin Principles, as they are usually referred to, have become extraordinarily influential in water governance. The first principle acknowledges the vulnerable and finite nature of water resources, and recognizes its role in sustaining life, the environment and development. The central role of women and the need for a democratic and participatory management model are asserted in the second and third principles. But it is the fourth principle, which has been most dominant in debates on water governance, and strengthened certain practices.

“Principle No. 4 – Water has an economic value in all its competing uses and should be recognized as an economic good

Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.”³⁴

This single principle has been the banner for many initiatives and programs of action. I would like to highlight how Wateau also draws our attention to the role of women in water rights transfers and how Quintela and Mascarenhas underline that in roman times in Portugal, they were already able to identify the “first signs of a time where management, rentability and effectiveness of the infrastructure of water became the first priority of concerns”³⁵. The Dublin Principles are an acknowledgement of existing practices in some parts of the world, especially where water is scarce, but their range of influence comprises the whole world.

These three developments – hydraulic state governance model increasing costs, economic paradigm shift, and the Dublin Principles – created the environment for a new water governance model to gain shape: a neo-liberal market one. The shift from a perception of water abundance to one of water scarcity and the economic shift from market failure to state failure changed the instrument settings for water governance. Moreover, the mechanism to achieve the overall goals of the governance regime changed from social equity guaranteed by the state to economic equity facilitated by the market. The Dublin Principles were fundamental for both changes. The water governance goals were also modified. During the hydraulic state governance model the overall goal was universal provision; whereas the neo-liberal market model seeks efficiency, above all. This change of water governance model is basically a process of marketization of water resources.

Within this new policy paradigm, government entities began to search for ways to both financially discipline and improve efficiency in the water sector. The immediate consequences were two fold. Many governments decided to allow private actors to participate in the water sector, expanding the market opportunities

³⁴ INTERNATIONAL CONFERENCE ON WATER AND THE ENVIRONMENT, *The Dublin Statement on Water and Sustainable Development*, World Meteorological Organization, 1992, available from <www.wmo.ch/web/homs/documents/english/icwedec.html> accessed 10 February, 2005.

³⁵ A. QUINTELA & J. MASCARENHAS, “Barrages romains . . .”, *op. cit.*: 28.

for private investment (private sector participation). This has directly questioned the public nature of the water sector, i.e., water's social status. In some cases, even water's public ownership has been challenged. Water charges are the other prong of the marketization process (commodification). Prices became the most preferred means to achieving efficiency, and allegedly sustainability. Water charges challenge the heart of the public service notion, because they have the potential to exclude water users, in addition to minimizing wasteful water use. For example, at the end of October 2004, "two dozen workers [sent by the Atlanta Department of Watershed Management] began turning off the water of customers who were more than 30 days delinquent, estimated to be about a quarter of the city's active 134,000 accounts"³⁶. The Department was owed around \$35 million and it intended to "shut off about 400 to 500 delinquents a day until the backlog [was] eliminated"³⁷. Because there is potential for water services to be discontinued in case of consumer nonpayment, and water is an essential resource for human survival, exclusion is an extremely important social and political issue.

Moral Ituarte and Silva Pérez address this issue explicitly when analyzing the governance of the Spanish Guadalquivir river basin. They discuss the 1999 Spanish Water Law that embraces this neo-liberal market water governance model, by predicting the creation of water markets and water banks. Their analysis is extremely updated and pertinent, since they also include the negative reactions to these new governance principles. They question this new legal framework, that in fact has not been implemented yet, highlighting how in draught times, some farmers defend a "social sharing" of water³⁸. Furthermore, they conclude farmers do not have a market relation with water and are not comfortable with references to "selling water"³⁹. Their article goes to the heart of the current water debate.

The emergency of a lifestyle transformation

The neo-liberal market governance model has triggered fierce and violent reactions all over the world. The contributions of this thematic *Dossier* do not include two issues related to this water governance model that I find crucial when it comes to sharing water: the human right to water and the international sharing of water. No water volume should aspire to exhaust the theme, and these contributions were clearly focused on domestic dynamics of water sharing. Nevertheless, some of the considerations presented are directly related to the existence of a human right to water and indirectly connected to the international sharing of this resource.

Both the hydraulic state and the neo-liberal market governance models strengthen and are made stronger by the current lifestyle model characterized by mass production and consumption, where efficiency constitutes the crucial factor. This lifestyle has its origins in the dynamics presented and discussed by several of the

³⁶ A. HART, "Atlanta Shutting Off Water as It Tries to Collect \$35 Million Overdue", *New York Times*, 3 November, 2004: 13.

³⁷ *Ibid.*

³⁸ L. Moral ITUARTE & R. Silva PEREZ, "Grandes zonas regables . . .", *op. cit.*: 142.

³⁹ *Ibid.*

articles revised here. The consolidation of a modern state, the absolute value of modernization and economic growth, the unchallenged primacy of capitalism need a water governance model based on efficiency, on economic growth and technological solutions to any water shortages that may occur.

Human Right to Water

The main result of the marketization process is the perception that the state is withdrawing, and being replaced by the market. The notion that the state is retreating from the water sector has not only triggered opposition from international organizations, such as the Association for a World Water Contract⁴⁰, but has also met domestic social protest from both supporters of a public water system as well as anti-globalization and anti-free trade activists. In several countries, such as Argentina, Bolivia, The Philippines, Great Britain (England and Wales), Nicaragua, Uruguay, and Canada, citizens reacted against private sector participation, against water charges, and against what they understood as an abnegation of the state's obligations and responsibilities. They demand 'the return of the state' and the removal of private actors from the water sector. These demands have materialized in the form of termination and suspension of public-private contracts, revocation of legislation passed under the neo-liberal market impulse, and new regulation to define water's governance regime in a different direction from the market. The move for states to renegotiate with the markets the obligations and responsibilities in the water sector has also produced a backlash against several water multinational companies, which have seen their interests abroad threatened⁴¹.

The governmental responses have varied⁴². Some countries, such as Bolivia, after having redefined water as a commodity, have then explicitly re-redefined it as not being a commodity. Others, such as Canada, have attempted to resolve the tension through domestic negotiations and by making use of legal and procedural possibilities in order to clarify water resources' social nature. Canada managed to thwart projects of international water trade through environmental legislation at both the federal and provincial levels. Others yet, such as Uruguay, have decided to democratize the discussion by holding a *referendum*⁴³. Others have yet to address this issue.

⁴⁰ In the original: *Association pour le Contrat Mondial de l'Eau* (ACME).

⁴¹ For example, the water multinational Bechtel saw its contract for the Bolivian Cochabamba water utility annulled in 2000, after water charges increased dramatically, and the population reacted violently. In 2005, the Bolivian government succumbed once again in face of major protests over the contract signed between the French water multinational Suez and the El Alto water utility in the La Paz region. The demands were for an expansion of the water supply coverage and against the increase of water charges.

⁴² For an in-depth analysis of Bolivia, France and Canada see P. D. LOPES, *Water with Borders: Social Goods, the Market and Mobilization*, Baltimore, The Johns Hopkins University, PhD thesis, 2005.

⁴³ On 31 October 2004, "more than 60 percent [of Uruguayans] came out in favour of introducing a constitutional clause stating that 'water is a natural resources essential to life' and that access to piped water and sanitation services are 'fundamental human rights'" (R. PIERRI, *Uruguay: Referendum Gives Resounding 'No' to the Privatisation of Water*, Inter Press Service News

Anti-free trade and anti-globalization movements, as well as international water-specific organizations, have also joined in the contestation against water marketization. They oppose the initiatives developed by the World Water Council, the Global Water Partnership, the United Nations (UN), and the water multinational companies. The water-specific members of this group oppose the commodification of water, endorsing water as a human right. They also endorse a participatory model for water management, as opposed to the emphasis on good governance conferred by the World Bank and most UN agencies.

Both articles by Moral Ituarte and Silva Pérez, and by Madani, refer to aspects associated to the notion of a human right to water when they discuss the “social sharing of water” and the “eternal rights to water”, respectively. Even if it is not explicitly acknowledged, the human right to water is enshrined in the ancient principles of water sharing as well as in the universal provision sought under the hydraulic state governance model. The neo-liberal market governance model undermines those customary practices, demanding economic rationality in water’s governance, in order to face scarcity. Although the human right to water would definitely place water governance back under state’s responsibilities, and some water consumption patterns might have to change accordingly, the odds for everything remaining the same are very high. The UN Human Rights Declaration institutes the right to food, shelter, health, clothing, among others, and that has not prevented states from failing to guarantee those same rights or the market to determine most of their allocation. The modern hydraulic society lifestyle will not change with the decree of a human right to water.

International Sharing of Water

The importance of international sharing of water is associated to the human right to water, but also to the occurrence of violent conflicts. The domestic hydraulic state governance model has been accompanied, internationally, by a strong territorial approach. The states have dealt with water internationally, insofar as the water resources were internationally shared. International water resources have been a prerogative of states’ negotiations and, therefore, have been governed by international treaties among riparians. The guiding principles of these treaties have evolved over time. There are, nevertheless, several principles which seem to have achieved early consensus. First, only riparian states, as far as no agreement to the contrary existed, have had any legal rights to use the waters of a transboundary body, such as a river, lake or aquifer. And second, downstream countries have been entitled to an equitable share of transboundary waters. This principle actually entailed a sort of ‘natural right’ to the lower riparian to a minimum quantity of water needed for its survival and development. Equitable utilization is the key element in this principle and restricted sovereignty is the international status applied. The natural right to water of the downstream country strengthens the idea that even internationally water has constituted a basic right, i.e., a social good.

Agency, 2004, available from <www.ipsnews.net/interna.asp?idnews=26097> accessed 18 August 2005). The result of the referendum also included the decision that “piped water will be supplied [...] ‘exclusively and directly by state-owned legal entities’, and concessions to private firms will be cancelled” (*ibid.*).

The Dublin Principles led to several new international institutional initiatives, and the economic paradigm shift created new business opportunities. On the one hand, several developed countries followed the marketization trend and allowed private economic actors to participate in their water sectors. The same dynamics occurred in developing countries, but as a result of conditionality by the World Bank⁴⁴, the International Monetary Fund, bilateral investment agreements, and other development aid agencies. On the other hand, the implementation of market mechanisms and instruments, such as private sector participation and water charges, created an environment conducive to international bulk water⁴⁵ trade. The ‘window of opportunity’ was further widened with the claim that major international trade treaties actually already covered bulk water trade. The Harmonized Commodity Description and Coding System (Harmonized System)⁴⁶ is the official classification of internationally traded goods for the World Trade Organization. According to those who defend bulk water trade, the Harmonized System already predicts bulk water as an internationally traded good, under the sub-heading “22 Beverages, Spirits and Vinegar”, specifically under

“2201.90.00.00 Waters, including natural or artificial mineral waters and aerated waters, not containing added sugar or other sweetening matter nor flavored; ice and snow.”⁴⁷

It is within this ‘window of opportunity’ that bulk water export projects emerged in Canada, Bolivia and France, as well as several others plans in other countries. These projects imply a fundamental challenge to riparians’ monopoly of their waters, and also to their ‘natural right’ to sufficient water for survival, adopting the price mechanism for international water allocation.

Conflicts and Violence

The end of abundance, the retreat of the state, the creation of non-riparian water rights, the commodification of water, all contribute to reinforce the idea that the wars of the twenty-first century will be over water. In fact, many have predicted that the current situation will result in water wars⁴⁸. This prediction has been

⁴⁴ For example, the World Bank used private sector participation in Bolivian water utilities and the implementation and/or increase of water charges as both a means of pressure and explicit conditions of aid. For a vivid account of this dynamics see C. Crespo FLORES, *La guerra del agua de Cochabamba: Cinco lecciones para las luchas anti neoliberales en Bolivia*, available from <www.aguabolivia.org> accessed February 2, 2005; C. Crespo FLORES, *El Banco Mundial Sócio de Águas del Illimani: sus implicaciones y riesgos*, available from <www.aguabolivia.org> accessed February 3, 2005, and J. SCHULTZ, “The Politics of Water in Bolivia”, *The Nation* (web only), posted on January 28, 2005.

⁴⁵ Water in bulk is transported by pipes, canals, tankers, floating bags. According to Canadian legislation, water trade is considered bulk when transported in containers bigger than 20-30 liters.

⁴⁶ The Harmonized System was established by the World Customs Organization (WCO). The system is used to classify goods traded internationally and came into force in 1988 for the WCO member countries (currently 166).

⁴⁷ WORLD CUSTOMS ORGANIZATION, *Harmonized Commodity Description and Coding System*, 2005.

⁴⁸ P. ANNIN, *The Great Lakes Water Wars*, Washington, D.C., Island Press, 2006; M. VILLIERS,

cited over and over again, after the former-Vice-President of the World Bank, Ismail Serageldin, publicly stated that the wars of the twenty-first century will be over water, as the ones from the twentieth century were over oil⁴⁹. This argument became almost intuitively accepted. After all, water has all the characteristics to explain why people would choose violence to address a conflict of interests concerning water access and/or use. Water is non-substitutable. In some regions, water is scarce, affecting not only the economic survival of those regions, but also the physical survival of their population. Water resources are physically connected to territory, which automatically triggers issues of sovereignty. In addition, 263 rivers, accounting for 60% of the world's water resources, cross political borders, involving 145 states, of which 54 have at least 95% of their territory within these international water basins, which are home to 40% of the world's population⁵⁰.

Several researchers have worked on this topic, but the most renowned are probably Peter Gleick⁵¹, Aaron Wolf⁵² and Thomas Homer-Dixon⁵³. The former publishes a bi-annual water report on the world's fresh water, including a water conflict chronology, including threats to use force when facing a water conflict. Although researching a broader dynamic – environmental scarcity – Thomas Homer-Dixon work also applies to water resources. This author argues that environmental scarcity may result in or exacerbate existing violent situations: an increase in demand, a decrease in supply and/or an unequal distribution of environmental resources contribute to environmental scarcity⁵⁴. Thus, environmental scarcity, including water resources scarcity, can lead to endemic poverty, large scale migrations, growing social tensions and, consequently, to a weakening of social and political institutions. The author clarifies that the relation between environmental scarcity and violence is not direct, i.e., environmental scarcity is not a necessary nor even a sufficient condition to trigger organized armed violence. Environmental scarcity interacts with economic, social and political conditions that determine the peaceful or violent development of the conflict in question. Although, Homer-Dixon defends that most of these violent conflicts, if to occur, will take place within national boundaries, he acknowledges that these violent dynamics will most probably have international spill-over effects.

Water: the Fate of our Most Precious Resource, New York, Mariner Books, 2001; D. WARD, *Water Wars*, New York, Penguin Group, 2003; T. HOMER-DIXON & J. BLITT (eds), *Ecoviolence: Links Among Environment, Population and Security*, Lanham, Rowan & Liittfield Publishers, 1998; A. WOLF, “‘Water Wars’ and Violence”, Princeton, Princeton University, 1999.

⁴⁹ V. SHIVA, *Water Wars: Privatization, Pollution and Profit*, Cambridge, South End Press, 2002.

⁵⁰ A. WOLF, “‘Water Wars’ and Other Tales of Hydromythology” in B. McDonald & D. Jehl (eds), *Whose Water is It? The Unquenchable Thirst of a Water-Hungry World*, Washington D.C., National Geographic, 2003: 109-124.

⁵¹ P. GLEICK, *The World's Water 1998-1999: The Biennial Report on Freshwater Resources*, Washington, D.C., Island Press, 1998.

⁵² A. WOLF, *Transboundary Freshwater Dispute Database – International Freshwater Treaties Database*, 2005, available from <<http://ocid.nacsc.org/cgi-bin/qml>> accessed February 9, 2005; A. WOLF, “‘Water Wars’ . . .”, *op. cit.*

⁵³ A. WOLF, “‘Water Wars’ . . .”, *op. cit.*

⁵⁴ T. HOMER-DIXON & J. BLITT (eds), *Ecoviolence . . .*, *op. cit.*

Aaron Wolf deconstructs the prediction of ‘water wars’, calling them a ‘tale of hydromythology’⁵⁵. According to Wolf’s findings, there has not been a water war since 2000 b.c., between the Sumerian city-states of Lagash and Umma, by the river Tigris⁵⁶. Aaron Wolf does not deny the fact that water resources may have/had a significant role in the evolution of certain conflicts into violence, but he researched further to understand the reasons why water has not triggered regular wars and violent responses. His findings identified the institutional factor (international treaties and institutions) as decisive in addressing conflicts in a violent or peaceful manner. In other words, Aaron Wolf and his team observed that in cases where water conflicts did not result in violence, institutions existed or had been created to regulate, manage, dilute and/or settle these conflicts⁵⁷. Moreover, it was not just the institutional factor that statically showed relevance. Following a dynamic approach, the conclusions were that the institutions that were able to absorb and manage drastic changes constituted the crucial element determining the resort to peaceful means as opposed to violent ones, in order to address the conflict⁵⁸.

Cressier does mention that water sharing “is not totally without violence”⁵⁹, and he goes further to identify some probable causes, such as “climate degradation, arrival of massive numbers of new people or imposition of a new political order”⁶⁰. These factors match perfectly with the generic dynamics underlying violent conflicts identified by Homer-Dixon: decrease in supply, increase in demand and/or unequal distribution, respectively. Cressier also states that sharing does not necessarily implicate conflict⁶¹. I would like however to distinguish conflict from violent conflict⁶². As long as two people want the same thing, there will be conflict. Consequently, more often than not, water sharing implies conflict. However, it does not have to imply violent conflict, as Aaron Wolf demonstrates there are more examples of water conflicts being managed by peaceful means, through international negotiations and treaties, than by violent means.

Lasserre refers to the question of adaptability, which leads me to my final comments. Both Aaron Wolf⁶³ and Homer-Dixon⁶⁴ discuss, in different ways, adaptability. Wolf identifies that violence depends not only on the existing international institutions to govern shared water, but also on those institutions’ adaptability to drastic changes. Homer-Dixon argues that each society’s ingenuity will determine their solution to these (and other) challenges. Lasserre refers both Homer-Dixon

⁵⁵ A. WOLF, “‘Water Wars’ . . .”, *op. cit.*

⁵⁶ P. GLEICK (ed.), *The World’s Water 2006-2007: The Biennial Report on Freshwater Resources*, Washington D.C., Island Press: 2006; A. WOLF, “‘Water Wars’ . . .”, *op. cit.*

⁵⁷ A. WOLF, “‘Water Wars’ . . .”, *op. cit.*

⁵⁸ *Ibid.*: 118.

⁵⁹ P. CRESSIER, “Géométrie des réseaux . . .”, *op. cit.*: 40.

⁶⁰ *Ibid.*

⁶¹ *Ibid.*

⁶² M. R. FREIRE & P. D. LOPES, “Rethinking Peace and Violence”, paper presented at the 49th International Studies Association Annual Convention, San Francisco (USA), 26-29 March, 2008.

⁶³ A. WOLF, “‘Water Wars’ . . .”, *op. cit.*

⁶⁴ T. HOMER-DIXON, *The Ingenuity Gap: Facing the Economic, Environmental, and Other Challenges of an Increasingly Complex and Unpredictable Future*, Knopf, 2000.

and Ohlsson, the latter with the concept of ‘social adaptation capacity’⁶⁵. What is left unclear is if this adaptability is to keep the *status quo* or to challenge the existing lifestyle model. Even if institutions, ingenuity and adaptability might prevent us from violently fighting over water, water scarcity will not just go away. This is because, on the one hand, water scarcity is a result of nature’s distribution, but on the other hand, and arguably more important, it is a consequence of policies over human settlements, land use, economic growth and human patterns of consumption (and production). Besides adaptability, there is a vital need for adapting our lifestyle to a new physical reality, and this requires ingenuity, but not of a technological nature to guarantee our current lifestyle, rather of a social and political nature to change our lifestyle into one more in tune with nature and with our responsibilities to future generations. The current development model needs to be abandoned and not adjusted, because the overall aim will not be altered with adjustments. Humans need to change their production and consumption patterns and an integrated land and water usage planning needs to be adopted, including the expansion of existing or creation of new human settlements.

* * *

The contributions to this special number on sharing water are extremely pertinent and jointly address the main elements of different water governance models. Their case studies illustrate in a very interesting and vivid way several of the water dynamics states and communities are still currently facing. Although they never address the end of abundance or the emergency of a lifestyle transformation, their analyses identify some of the factors that contribute to these considerations. The most important role of this *Dossier*, in my opinion, is two-fold. On the one hand, these contributions show the pertinence of water issues regardless of time, space and culture. On the other hand, although most of the cases are relatively close, in geographical terms, these contributions shows us not only the diversity of governing rules but also the different perspectives water can be studied through. Finally, the overall title reflects the constant struggle and efforts to share water between countries, communities, individuals, which is inherent to human life as we know it. The end of abundance exacerbates the vital need to sharing water and it is this sharing that begs the emergence of a lifestyle transformation.

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⁶⁵ F. LASSERRE, “Le partage de l’eau dans le monde : un enjeu majeur du XXI^e siècle”, *Mélanges de la Casa de Velázquez* (Madrid), XXXVI (2), 2006: 177.