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Water is not (yet) a commodity: Commodification and rationalization revisited

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ABSTRACT: The article examines the process of water commodification as part of the long-term process of capitalist rationalisation. It explores these processes in the light of Norbert Elias' concept of the 'triad of basic controls', which casts light on the mechanisms developed by humans in the course of human history to establish controls over the non-human world as well as on inter- and intra-human relationships. The article discusses the commodification and valuation of freshwater exploring the internal tensions and contradictions of capitalist rationalisation and its interplay with alternative rationalities that characterise water-related human interactions. It argues that if a conceptually restricted concept of commodification is applied, then we can conclude that most water in the planet remains un-commodified owing to the slow and fragmentary character of the capitalist rationalization process in water-related human interactions.

KEYWORDS: Commodification; rationalization process; triad of basic controls; valuation, water

This article examines current debates about the commodification and valuation of water in the light of the long-term historical process of rationalization, with a particular focus on the case of freshwater. [\[\[1\]\[#N1\]\]](#) It builds on previous work about the historical intertwining of the activities of water control and the development of citizenship (Castro, 2006), which I examined following the notion of 'triad of basic controls' that was put forward by Norbert Elias (Elias, 1978: 156–57; see also Goudsblom, 1992; De Vries and Goudsblom, 2002; Sutton, 2004). As Elias argued, humans have established different forms of control over a) the non-human world, over b) inter-human interactions, and over c) intra-human (the self, including the body) processes. Specific mechanisms of control are usually intended to achieve certain results, as in a) the building of dams to prevent flooding, to secure the provision of freshwater for domestic uses and irrigation or to generate hydroenergy, in b) the establishment of norms and institutions to regulate the ways in which humans govern and use water for different purposes from the satisfaction of their basic needs to the large scale production and consumption of water-based goods and services, and in c) the evolving forms of control over our own selves associated with the individualization process, such as ever more elaborated water-based hygiene and bodily care (see Elias, 1994: 252, note 124). However, increases in human control also lead to unintended, unforeseen, and often uncontrollable increases in human dependence and to the development of original forms of social interaction at all levels (Goudsblom, 1992; De Vries and Goudsblom, 2002). As illustrated later, the case of water is particularly topical in this regard, as the wide ranging forms of basic controls developed in the course of human history have made us extremely dependent, for instance through the transgenerational mortgage commitments acquired to maintain and expand the water infrastructures that protect and make human life viable (e.g. Elvin, 1994: 4; McNeill, 2000: 190–191) or through the institutional arrangements that often become structural conditions and emerge as inertial forces that influence or even determine individual and collective behaviour in relation to the government, regulation, and uses of water sources and services (Castro, 2009).

In relation to the latter point, despite significant advances in our knowledge of these processes, it can be argued that Norbert Elias' assessment regarding the unstable balances between 'rational', intentional planning and policy decision making and the largely autonomous web and flow of social processes remains valid and up to date:

[c]ontemporary governments commonly assert –perhaps in good faith– that they can overcome the acute social problems of their country 'rationally' or 'realistically.' In fact, however, they usually fill the gaps in our still fairly rudimentary factual knowledge of the dynamics of social interweavings

with dogmatic doctrines, handed-down nostrums, or considerations of short-term party interests. Taking measures mostly by chance, they remain at the mercy of events, the sequence of which governments understand as little as those they govern (Elias, 1978: 31).

The empirical field of water-related human processes is particularly illuminating to examine not just the tensions and contradictions between 'rational' and 'non-rational' (or even irrational) aspects, but also the interlinkages between always evolving, alternative and often mutually exclusive forms of rationality interwoven with non-rational or irrational processes (see also Mennell, 1989: 103-104). Examining the historical processes of valuation and commodification of water, and of any other elements of the natural world for that matter, offers a rich source of empirical examples for developing a better understanding of the underlying causes of some of the most 'acute social problems' facing human society in the twentieth-first century, such as the protracted and worsening long-term patterns of structural inequality associated with the government, management and allocation of the world's freshwater affecting a very large proportion of humankind. In the course of history humans have become ever more dependent on freshwater, not just for drinking but also, among other crucial activities, to produce food, to generate energy for industrial uses, or to provide essential water-based sanitation services. At the time of writing this article, according to official United Nations (UN) reports around 11 per cent of the world population, almost 800 million people, has no access to even one litre of clean water to satisfy basic human needs, although the report warns that the proportion of people without safe water is likely much higher: we just do not have reliable information about the quality of water provided to people in many regions. [2] [N2] Also, 15 per cent of the global population, around 1.1 billion people, still lacks access to any form of sanitation and practice open defecation (UN, 2012a: 52–55). More generally, an examination of the broad historical patterns of human interaction with the water environment, particularly since the late nineteenth century, provides a bleak picture not just regarding the striking social inequalities and power imbalances in the access to water and water-based goods and services but more worryingly about the very future of the hydrosphere and, consequently of the biosphere as we know it.

[3] [N3]

In this connection, although the article considers in different degrees all three forms of basic controls distinguished by Elias, the main focus is on the second component dealing with norms and institutional arrangements, and particularly with those associated with the long-term processes of water valuation and commodification. The contemporary relevance of the topic is paramount, as suggested for instance by the significance that global financial interests attach to the emergence of freshwater as the 'new commodity', the 'next commodity', the 'strategic commodity', or simply the 'next fortune' (Dugan and Fisher, 2006; Geman and Kanyinda, 2007; Hudson, 2007; Lewis and Smith, 2007; Royal Bank of Scotland, 2008). As a matter of fact, in recent years, governments and institutions with global influence have massively "handed-down", borrowing from Elias, nostrums, doctrines, and far-reaching policy reforms, too often inspired by short-term party interests, aimed at speeding up the process of capitalist commodification as the solution to world's 'water crisis' (e.g. Segerfeldt, 2005). In other words, these have been part of global attempts to establish forms of control at all levels, but particularly in the inter-human dimension, grounded on the doctrinarian belief that all aspects of human society should be governed by the rules of capitalist market systems whereby all forms of human interaction should resemble the basic social relationship characteristic of capitalist markets: the exchange of commodities by private property owners. Although these attempts have largely failed to achieve their expected results, they have given way to the emergence of unforeseen and potentially uncontrollable new structural problems and inertial forces. However, these interventions may have succeeded, at least to judge from the specialized literature and the international debate on the matter, in creating the illusion that water has already been transformed into a commodity, which is the main topic of this article.

In this regard, my main argument is that the often-repeated notion that water has already become a commodity would have relatively weak empirical correspondence on a global scale. This is the case I contend, because although relentless, the unfolding processes of capitalist rationalization involving particular forms of water valuation and commodification are highly fragmented, patchy, and rather embryonic when compared against the advances made for instance by the commodification of other 'natural resources' including not least the human body (see, among other recent discussions on the subject: Almeling 2007; Seale, Cavers, and Dixon-Woods, 2006). In fact, examining the empirical field of water-related human interactions in their different dimensions, from the small scale activities of water gathering in remote rural areas to the management of vast water volumes in the ever more numerous megacities of the world, it is possible to observe an intricate web of rational and

irrational elements that often become manifest even in the most pretentious scientific theories and explanations. Ancient myths, beliefs, principles, and practices developed in the course of human history can be found closely knitted with modern day fantasies, doctrines, and nostrums about water both as a natural element and in relation to its many functions for the biosphere and for humans in particular. And this is notably observable in relation to the forms of valuation that are prevalent worldwide in relation to water. As shown later, some of the fundamental assumptions underpinning the prevailing institutions, principles and practices of water government, management, and use worldwide are informed as much by rational science as they are by beliefs, mythical thinking, doctrinarian assertions, and short-term interests. This is not a merely academic disquisition because the consequences of the issues under analysis here are significant both in terms of our capacity to produce more precise and accurate knowledge about the mechanisms of social control over water and water-related human interactions as well as in practical terms for those more directly involved in the social and political confrontations that punctuate the process of democratization of water government, management, and allocation worldwide.

In relation to the main focus of the article, despite recurrent references in the specialized literature to the 'commodification of water' I want to argue that if we use a theoretically restricted concept of 'commodification', then for the most part the world's water, and not just the freshwater, remains un-commodified. [\[41\]\[#N4\]](#) If this argument holds, it can then be added that among other reasons, the fact that most water on the planet remains un-commodified can be understood as the result of the particular obstacles encountered by the process of capitalist rationalization in the interactions between humans and the freshwater component of the hydrosphere. In order to substantiate this argument I examine current debates and evidence about water valuation and the capitalist commodification of water. I argue that there exist rival, often incompatible, rationalities underpinning the forms of and the balances between human control and dependence in water-related human interactions. Among other relevant issues arising from these developments that I cannot explore in empirical detail here (but have addressed elsewhere: Castro, 2006; 2007; 2008; 2010) it is worth highlighting the formidable obstacles facing governments and other actors attempting to establish forms of control over water and water-related inter- and intra-human processes that are based on capitalist rationality, and particularly on capitalist forms of valuation and commodification. These obstacles include intended and unintended widespread and multifarious forms of social resistance to the encroachment of capitalist social relations in the activities of water government, management, and use even in the core capitalist territories.

The article approaches the topic from a long-term sociological perspective, drawing on contributions from political ecology, the sociology and anthropology of valuation processes, ecological economics, environmental history, and water-specific scholarship from a range of disciplines including engineering, hydrology, law, and public policy. Here, the article is in two main parts. The first part discusses the long-term development of water commodification, while the second addresses the process of capitalist rationalization with emphasis on the contradictions characterizing the valuation of water.

On water commodities and markets

The historical records show that for several millennia humans have established forms of control over water and over water-related human interactions with principles, institutions and practices for the government, management and allocation of freshwater that also included the possibility of treating water as a commodity that can be traded in markets. Indeed, selling water for a profit has a very long history, as shown by the fact that ancient Middle Eastern societies introduced rules to ensure fairness in the allocation of water sources and protecting the vulnerable sectors of the population from water profiteers. These rules included the banning of water vending in case of essential community uses, the Right of Thirst to safeguard the access to drinking water for humans and animals, and the principle that one cannot deny access to water for essential human use to anyone (Caponera, 1954; Civic, 1998; Hirsch, 1959). In practice, the specific mechanisms of social control developed around the circulation of water for essential human uses reflect diverse, even incompatible rationalities, and have taken different forms, including treating water as saleable commodity, gift, or collective right from times immemorial (on recent debates about the relationship between gifts and commodities see for instance Castree, 2003; Goddard, 2000; Lapavistas, 2004). These diverse rationalities and their resulting principles, institutions and practices have survived until the present and for instance it is possible to see their material expressions in contemporary cities like Cairo, where people leave their *zir*, clay jars containing drinking water, outside their houses for free use by thirsty passers-by (for a discussion on the contemporary relevance of these principles in North Africa and the Middle East, see: Salzman, 2005; Wolf, 2000). Similar principles can be

found in the Andean indigenous cultures of South America, which in recent times have inspired significant developments such as the successful global campaign for the recognition of the access to water for essential uses as a human right, eventually sanctioned by the United Nations General Assembly in May 2010 (UN, 2010; see also Fatheuer, 2011).

Interestingly, contemporary businesses selling all-purpose vending machines, including water vending devices, have traced the origins of their trade back to the Greek mathematician and engineer Heron of Alexandria (circa 10–70 AD), who reportedly invented a coin-operated machine for delivering holy water in temples (Vending Machine Business, 2009). Although it seems that Heron's device was designed to curbe wastage of holy water by careless worshippers rather than to sell water for private profit (Humphreys, quoted in Jaffe, 2006), his invention has attracted much attention from enthusiastic twentieth-first century business developers. Nevertheless, water vending as a mechanism for the control and regulation of water-related human interactions seems to have been pervasive in most societies as suggested by evidence from such dissimilar settings as the ancient Middle East (Caponera, 1954), Tenochtitlan, the pre-Conquest capital of the Aztec empire (Cortés, 1520), medieval European towns like fourteenth-century London (Sheppard, 1998; Sisley, 1899) or sixteenth-century Lisbon (Ramos Tinhorão, 1997), pre-Revolutionary Paris (Goubert, 1986), colonial cities of Iberian America such as Buenos Aires (Herz, 1979), Mexico City (Llamas Fernández, 1991), Rio de Janeiro (Soares, 1988), and São Paulo (Sant'Anna, 2007), or the urban centres of the Islamic world (Gran, 1999). More importantly in relation to our main argument in this article, the process of water commodification, understood as the private sale of water for-profit, notably for the control and regulation of essential human uses, is at least as old as written history.

On the latter point, and referring to the main argument, it is important to distinguish between the use of markets, including the circulation of water as a private commodity, as a mechanism for the control of water-related human relations and the process of water commodification grounded on modern capitalist rationality. In this regard, the concepts of commodity and commodification are recurrently used in both academic and non-academic work on water issues often with divergent and potentially contradictory meanings (Castree, 2003). Examples include recent academic titles critical of contemporary water commodification policies like Karen Bakker's *An Uncooperative Commodity* (Bakker, 2004) and McDonald and Ruiters' *The Age of Commodity* (McDonald and Ruiters 2004), references to the bottled water industry as a 'pure' example of Nature's commodification (Opel, 1999; Wilk, 2006), but also include UNESCO's Second World Water Report where domestic water and sanitation services were categorized as 'commodity goods' (United Nations Educational Scientific and Cultural Organization, World Water Assessment Programme [UNESCO–WWAP], 2006: 409), reports from global investment advisors alerting their clients about the potential of 'futures water commodities' (Lewis and Smith 2007), and of course the profuse work produced by social movements and other actors opposing the capitalist commodification of water in the name of citizen, community, human or Nature's rights (see for instance a review by Bond, 2004).

However, even in a broad sense, the concept of commodity originally defined by Marx as the articulation of use value and exchange value in the generalized production of social use values that characterizes the capitalist mode of production (Marx, 1974: 48), strictly speaking would only be applicable to a relatively restricted universe of freshwater uses. Undoubtedly water has a diversity of use values for humans, and this has underpinned the emergence of a whole universe of mechanisms for the government and regulation of water-related human interactions, including the development of social relations of production and exchange of water commodities such as different forms of street water vending to satisfy essential human needs in most societies. And yet, to what extent market-based mechanisms of social control established to govern water-related human interactions can be analysed as examples of water commodification in strict sense requires careful examination. In particular, capitalist commodification processes presuppose the existence of private property, that is, the private property right to exchange products in the market. There is a need to retain the conceptual distinction between exchange in general and the particular form of exchange that characterizes the commodity mode of production grounded on capitalist rationality: generalized for-profit exchange of privately owned products in markets.

In this regard, the forms of private property associated with water developed by humans in the course of history have mostly and with few exceptions been related to the right to use water (for personal or for other uses including productive activities) rather than to exchange water as a privately-owned product in truly capitalist commodity markets. For sure there are historical and contemporary examples of 'water markets' worldwide, such as the snow markets developed in Spain's semiarid Eastern coast (Mallol Ferrándiz, 1989) the groundwater

irrigation markets in the Canary Islands (Aguilera Klink, 2002; Macías Hernández, 1990), India, Bangladesh or Pakistan (Meinzen-Dick, 2000; Sadeque, 2000), or the so-called 'mature' or 'established' water markets in Southern Australia, Chile or parts of the United States referred below. And yet, there is an important caveat in relation to the actual meaning of 'markets' in these cases, in particular regarding their underlying rationalities and assumptions. For instance, to what extent the exchanges taking place in these 'water markets' reflect a capitalist rationality, i.e. are the result of spontaneous and free transactions between the owners of property rights to water products being exchanged, requires careful scrutiny. In fact, there is mounting evidence showing that there is a sort of mythical belief in the existence of capitalist water markets, a twentieth-first century 'siren song' as an analyst put it (Bauer, 2004). But this has become a powerfully seductive siren song being amplified and reproduced worldwide by influential social actors who are actively trying to establish capitalist market principles and institutions as the fundamental mechanism for the control of water-related human interactions at all levels. And yet, after examining the empirical evidence of contemporary examples of 'water markets', even authors sympathetic to the implementation of commodified water management policies have come to the conclusion that

Efficient market outcomes will only be achieved under certain conditions such as: an efficient flow of market information, for example price, demand, and supply; secure property rights; efficient market facilitators, and sufficient research effort. Probably the best example of such an efficient market is the share market. Water markets, however, lack most of these characteristics largely due to the nature of the resource and the market place, hence it is prone to market failures (Bjornlund and McKay, 2002: 788).

Similarly, other authors concluded in relation to the case of so-called 'water transfer markets' in contemporary Texas, that '[i]n reality, water transfers more often resemble diplomatic negotiations than simple commodity transactions' (Kaiser and Phillips, 1998: 429–430). Studies of policy-induced water markets in Chile, which became a very influential model implemented in many other countries since the 1990s, have also exposed the flaws and myths of assuming that these are actually functioning capitalist water markets (Dourojeanni and Jouravlev, 1999; Bauer, 2004). These examples are very relevant, because the Australian, Chilean and US water markets mentioned above are the main cases recurrently discussed in the mainstream literature to support the management and allocation of water through 'markets'. These are also key examples of the on-going attempts to speed up the capitalist commodification process through far-reaching reforms inspired in mythical and doctrinal beliefs in the superiority of market-based mechanisms over all other social mechanisms for the government, management and allocation of freshwater worldwide (I come back to this in the next section). However, these efforts have largely failed and the available evidence shows that strictly speaking, the generalized exchange of water as a commodity in capitalist commodity markets is rather rare. For this and other reasons discussed below, it is important not to assume that because the activities of water control, allocation and management worldwide are increasingly engulfed in one way or another by the dynamics of all manner of capitalist commodification processes, then water itself has already become a commodity in strict sense.

Water and the rationalization process

Although many elements of the rationalization process of which valuation and commodification are key components are not exclusive of the Western experience (e.g.: Gran, 1999; Hobson, 2004; Pomeranz, 2000), it has been Western-led forms of capitalist rationality that have come to dominate the world system during the last few centuries. However, in the case of water-related human interactions the advance of capitalist forms of rationality, which following Max Weber's classical insights are predicated on increasing calculability and predictability (Weber, 1946a: 139; 1946b: 215) have faced enormous obstacles. As Weber pointed out, the forms of calculability and predictability characteristic of capitalist rationality are grounded on precise knowledge and in the subordination and eventual displacement of pre-existing (superstitious, mythical, religious, etc.) knowledge and value systems by the forms of social organization and action characterizing Western capitalism, and particularly capitalist commodity production and circulation. However, even when dominant in many respects, capitalist rationality coexists with a wide array of alternative rationalities as well as with diverse forms of non-rational and even 'irrational' understandings and practices, and the field of water-related human interactions is particularly useful to illustrate this complexity. In this regard, the forms of control that different human societies

have developed in relation to the government, management and allocation of freshwater are highly diverse, often grounded on alternative and rival rationalities, and closely interwoven with mythical beliefs, fantasies, and doctrinal understandings about water as a natural element, as the basis of life, and as a pivotal functional component of the anthroposphere. Despite the increasingly accurate scientific explanations of water's composition, cycles, and functions developed during the last two centuries, humans remain heavily dependent on mechanisms for water-related social controls that emerged in earlier historical periods and continue to operate as fundamental assumptions on which we unconsciously ground daily practices and even collective decisions affecting the lives of millions of human beings. In this connection, it can be argued that in fundamental ways, and despite highly sophisticated advances in water science and technology, still in the twentieth-first century the relations between humans and water largely escape the embrace of the capitalist rationalization process even in the core territories of capitalist rationality (Strang, 2004; Strang, 2005).

This can be illustrated by a statement published in UNESCO's Third World Water Report about the quality of knowledge and information that most countries have in relation to water. It emphasises the lack of the kind of precise and reliable knowledge and information that are primary requirements for the calculability and predictability that underpins capitalist rationality:

Few countries know how much water is being used and for what purposes, the quantity and quality of water that is available and that can be withdrawn without serious environmental consequences and how much is being invested in water management and infrastructure. Despite the availability of new remote sensing and geographic information system technologies that can simplify monitoring and reporting and despite the growing need for such information in an increasingly complex and rapidly changing world, less is known with each passing decade (UNESCO–WWAP, 2009: xi).

More recently, the latest World Water Report reaffirms this assessment by admitting that “current understanding of the various pressures being placed on the water cycle is akin to islands of knowledge in a vast sea of unknowns” (UNESCO–WWAP, 2012: 33). It should be added that the fragmented, incomplete, and unreliable state of the type of water knowledge and information that are prerequisites for capitalist rationality to flourish extends to the crucial theme of water ownership and its regulation and administration. The virtual lack of knowledge about such issues as who owns what water or how much water is abstracted when, where, by whom and for what uses in vast expanses of territory, when not in whole countries, exposes some of the fragilities in the argument that water has already become a commodity in strict sense. Calculability and predictability are seldom achieved in most areas of water control and government, where a ‘general ignorance’ about even very basic information can be identified even in the territories of advanced capitalist economies (Yarrow et. al., 2008: 14). ^[5] This is especially true in relation to the intimate relationship between the commodification process and the rationalization of ownership embodied in the development of clear and secure private property rights that constitute the foundation of capitalist commodity markets.

In this connection, human societies have developed relations of property based on a diversity of forms of collective ownership over Nature's elements, water being a primary example. Not much has changed substantially since North and Thomas argued that the very slow conversion of collective into private, marketable forms of property over air, forests, water, and other resources, which for them was mainly due to technological and institutional underdevelopment, continued to be a major obstacle for the further expansion of Western-led capitalism (North and Thomas, 1973: 1–8, 91–101). Despite the radical efforts made worldwide since the late 1980s to accelerate the capitalist rationalization of the world's ‘water commons’ through massive privatization programmes that included the creation of private water rights and ‘water markets’, ^[6] the progress has been extremely modest. Among other significant causes of this failure we must list the fact that there exist rival, even incompatible rationalities underpinning the highly diverse forms of controls that humans have established over water and water-related human interactions, which is often manifested in open social and political opposition to the further expansion of capitalist rationality in the government, management and allocation of the world's freshwater (e.g.: Bakker, 2010; Castro, 2008; Goldman, 1998; McCarthy, 2005; Swyngedouw, 2005; Urs and Whitell, 2009).

From another angle, the pace of the capitalist rationalization process in relation to the world's water remains patchy in other fundamental aspects too, which is reflected among other issues in the fact that well into the

twentieth-first century we are still unable to respond to very basic questions that are the bread and butter of capitalist market rationality such as: What is the value of water? What is the source of its value? What is the nature (economic, social, political, and so on) of the value or values that we recognize in water and water-based goods and services? How are these values identified and measured? Can they be measured? What has to be included in the 'cost' of water and water-based goods and services? The 'cost' is a cost for whom? Why? Water's multidimensional functions as a fundamental component of the biosphere have posed major challenges to the long-term processes of valuation and commodification in different societies.

In this regard, the treatment of water values (and costs) in the specialized water literature is normally limited to the economic dimension of the problem, which in turn is often narrowed down to the market sub-dimension. Despite the increasing rhetorical recognition in this literature of the high complexity involved in estimating the value of water, in practice the arguments and the instruments proposed continue to reproduce a number of reductionist, and primarily economicist, assumptions that inform prevailing approaches to water government and management but also continue to reproduce and create new myths, fantasies, and doctrinarian beliefs about water and water-related human interactions.

The value of water

In recent years a rich literature covering a broad range of disciplinary fields has been published on the matter of water values and the valuation of water, where there is a certain agreement that water values are multidimensional, multilevel, and even that these values are often incommensurable. From a different perspective, it can be said that the recognition of this multiplicity and irreducibility of water values to a common denominator, such as the market value, reflects the existence of alternative rationalities and rationalization processes. For instance, a recent report on the state of the world's water stated that

As a physical, emotional and cultural life-giving element, water must be considered as more than just an economic resource. Sharing water is an ethical imperative as well as an expression of human identity and solidarity [...]. Valuing water, including sustaining and fostering water-related cultural diversity, heritage and knowledge, is critical to enhancing our ability to adapt in a changing world. Economic valuation of water resources must be recognized as existing within this larger and more complex context of valuing water (UNESCO–WWAP, 2006: 403, 405).

However, despite the increasingly extended formal recognition of water's multidimensional values illustrated by the statement, it can be safely argued that the prevailing understanding of water's value in Western capitalist cultures is based on three main reductionist assumptions, which reflect fundamental contradictions and tensions in relation to the capitalist rationalization process. The first assumption is that the main or even only source of water's value is human labour. ^{[71]#N71}In other words, despite much discussion about the multidimensionality of water functions and values, in practice there is no recognition of pre-social (and particularly pre-economic) dimensions of water's value. This is not exclusive of water but is rather the prevailing approach to Nature's value more generally that characterizes capitalist rationality (on this, see the debate by, among others: Benton, 1989; Burkett and Foster, 2006; Giri 2004; Martinez Alier, 2002; Murphy, 1994, 1997; O'Connor, 1998). An important consequence of this assumption is that disregarding the wide-ranging forms of water sources or uses, from the abstraction of renewable surface water to the pumping of (virtually non-renewable) underground fossil water, from using water to meet essential human needs in a small village to large-scale commercial irrigation, aquaculture, hydro-energy production, etc., water's value would be always estimated as a combination of capital (understood as past or dead labour) and labour costs. That is, in the dominant approaches grounded on capitalist rationality water itself is gratis, a gift of Nature, as in the classical definition of Alfred Marshall: 'the material and the forces which Nature gives freely for man's aid, in land and water, in air and light and heat' (Marshall, 2009: 115). ^{[81]#N81}A second assumption is that the volume of usable freshwater is unlimited, everlasting, and self-purifying, even if its actual availability is subject to uneven geographical and temporal distributions. The deep-rooted beliefs underlying this assumption could perhaps be traced back to Hesiod's Theogony, which recorded the ancient myth of Okeanus, an infinite freshwater river that encircled the earth (Bryant, 1986: 282). Although today the assumption of freshwater as limitless bounty is increasingly difficult to defend in rational argumentation, not least in the light of the overwhelming evidence of the shrinking and even exhaustion of clean

freshwater sources worldwide, [9] it remains entrenched in the daily practices and culture of large majorities of human beings. Last but not least, a third assumption that has dominated thinking and practice about water in the West since the Industrial Revolution is that water is a 'resource', that is the reduction of water's multidimensional functions and values to that of being a factor of human development.

These assumptions underlie reigning thinking and practice in relation to water, including when water plays the function of environmental sink (e.g. water bodies as direct or indirect receivers of pollution flows), medium or support (e.g. for recreation, navigation or fisheries), or hazard (e.g. flooding, disease transmission, etc.). The first and the third assumptions can be clearly connected with capitalist rationality, whereby the valuation of water is driven by the dynamics of capitalist production and accumulation and leaves out (or behind) alternative value systems and rationalities. However, the carelessness and wastefulness associated with the second assumption represents a major contradiction – an 'irrational' element – in the capitalist rationalization process. On the one hand, for instance, much of the mostly uncontrolled abstraction of water and disposal of untreated wastewater worldwide can be considered as the permanent re-enactment of the most primitive form of capitalist accumulation, also seen in relation to other 'natural resources' (see for instance: Mansfield, 2004). Primitive water accumulation, as we can call the process borrowing from Marx's original contribution, is certainly rational from the perspective of individual capitalists or fractions of them, as it secures free or very cheap access to such crucial production factors as raw freshwater or wastewater sinks. This is also often achieved through unequal ecological exchanges (e.g. the exploitation of other people's water resources through the import of water-intensive foodstuffs and other goods and products without a proper retribution for the water used in the process or the transfer of ecological burdens such as the pollution of water sources to other regions or countries, which has been conceptualized as 'toxic imperialism'), one of the mechanisms that humans have established to exercise control over inter-human interactions in relation to the government, management and allocation of natural resources, including water (e.g. Guha and Martínez Alier, 1997, Martínez-Alier, 2002; see also the debates about 'virtual water' in Allan, 1998, 2002, and the 'water footprint' in Chapagain and Hoekstra, 2004, and Hoekstra, 2006, 2007). However, from the perspective of a collective capitalist rationality unrestrained and uncontrollable primitive water accumulation reflects not only the currently prevailing state of 'general ignorance' in relation to the world's freshwater (paraphrasing Yarrow et. al., 2008: 14) but also the self-destructive character of capitalism that erodes its very own ecological foundations (e.g. O'Connor, 1998). On the other hand, the prevalence in the twentieth-first century of human fantasies and myths about freshwater's limitless abundance, self-cleanliness, and everlasting availability, even in the core capitalist societies, calls seriously into question the degree of penetration of capitalist rationality in the sphere of water-related human activities, as it stands in radical contrast with the calculability and predictability required for the functioning of capitalist commodification. In fact, I shall argue, the patchy and uneven progress of capitalist rationality in the fields of water government, management, and use is what makes the possibility of commodification of yet un-commodified water emerge as a new frontier in this long-term development.

Central aspects that illustrate the contradictory rationality grounded on these assumptions were captured in a recent book on the history of the Niagara Falls, which is a very good example, among other things, of the interplay between intended human controls and their unintended outcomes.

In the 1890s, as the Falls were being harnessed, a flood of articles about Niagara power hit newsstands [...] promoting the image of Niagara as unending bounty. *Popular Science Magazine* declared in September 1894 that 'people in general have the idea that the Niagara water power is inexhaustible, and so it probably is, so far as human requirements go'. [...] By 1903, *Harper's Weekly* could crow that Niagara was turning out, as hoped, to be 'an illimitable supply of cheap power' (Strand, 2008: 163, 164, 175).

Human fantasies and myths about water and hydroenergy as an unending bounty dominated for decades the prevailing discourses but also the 'rational' policy making and implementation that brought to Niagara Falls rapid industrial development and urbanization. However, the Niagara Falls area also became one of the birth places of the now global 'environmental justice movement' that emerged since the 1970s in connection with the health impact of hazardous pollution caused by the industrial activities attracted by the promise of limitless and cheap hydropower (Gibbs, 2002; Livesey 2003). By now the significance of the Niagara Falls has been dwarfed by

other gigantic water infrastructures, like the Itaipú Dam in the Brazil-Paraguay border, named one of the 'Seven Wonders of the Modern World' by the American Association of Civil Engineering in the 1990s (ASCE, 2011) or the Three Gorges Dam in China completed in 2003, currently the world's largest. However, as the claim in a recent article on Chinese water engineering that '[h]ydropower's fuel is "essentially infinite"' suggests, human fantasies and beliefs underlying the assumption of unending and limitless water availability remain as powerful as ever (Huang and Yan, 2009: 1653). Similarly, protracted human beliefs in water's endless self-purifying properties may still play a part in explaining why still in the twentieth-first century about 80 per cent of the world's urban wastewater, often including hazardous industrial waste, is discharged completely untreated into the environment (UNESCO–WWAP, 2009: 141). And it is worth noting that this problem is not a preserve of poor countries that cannot afford expensive treatment technologies but is rather a pervasive situation affecting almost every country on earth. ^[12] In this regard, there is strong evidence to argue that despite the progress made in the last few decades in developing a more sophisticated understanding of water's 'worth', and despite the increasing rhetorical recognition of the complexity of water's values, deeply-rooted human fantasies, beliefs, and assumptions far removed from empirical realities remain as the core principles informing the ways in which humans value and relate to water in practice.

Nevertheless, a rising awareness about the potential or actual consequences of the far-reaching anthropogenic transformations of the hydrosphere experienced in recent decades has prompted an increasingly vocal debate about water valuation and the valuation of Nature more generally. A turning point in this process was probably marked by the 1992 *Dublin Statement on Water and Sustainable Development* (UN, 1992). In particular, the First Principle of the Dublin Statement asserted that '[f]resh water is a finite and vulnerable resource, essential to sustain life, development and the environment', while the Fourth Principle stated that '[w]ater has an economic value in all its competing uses and should be recognized as an economic good' (UN, 1992). In the case of the First Principle, it could be argued that this recognition of freshwater's finiteness and vulnerability reflected changes in the power balances between the prevailing productivist and economicist rationality and the increasingly influential, at least at the discursive level, ecological rationality within international policy circles. This rebalance had been also boosted by the debate on 'sustainable development' triggered by the creation of the World Commission on Environment and Development (WEDC) in 1984 and the subsequent publication of the Commission's report *Our Common Future* (WCED, 1987). And yet, regarding the Fourth Principle, although the recognition of water's economic value was rightly celebrated by many as a positive step forward, the ensuing interpretations and actual policy applications based on this principle have often contributed to exacerbate the reductionism and one-dimensional thinking that has characterized the valuation of water within the framework of prevailing primitive forms of capitalist rationality. Moreover, the Fourth Principle has been often invoked to justify massive attempts to speed up the commodification of water sources and water-based goods and services often through the revival of old or the creation of new myths, fantasies, and beliefs that do not resist the scrutiny of rational scientific analysis.

Firstly, the renewed emphasis on the need to recognize the economic value of water has often led in practice to a reductionist approach whereby a) the multidimensional functions and values of water tend to be transmuted into a policy-friendly economic equivalent or simply lost, and b) economic complexity itself tends to be diluted into the prosaic instrumentality of short-term market considerations. Secondly, although the illusory assumption of water's limitless abundance was critically exposed in the First Principle, the Fourth Principle has often been used to support the equally fallacious notion that the marketization of water government and management would not only solve most water allocation dilemmas but also the puzzles posed by the valuation of water in different contexts. Although this fallacy has been largely exposed as a 'siren song', it continues to seduce influential policy debates and actual policy making about 'valuing', 'pricing' and 'marketing' water (see, among others: Whittington, Briscoe, Mu, and Barron, 1990; Lee and Jouravlev, 1998; Moss, Wolff, Gladden, and Gutierrez, 2003; Addams, Boccaletti, Kerlin, and Stuchtey, 2009; Rouse, 2009). Unfortunately, even long-standing methodological discussions about what should be included in estimations of the 'full value' of water have difficulty in moving beyond the conventional definition that identifies 'measurable value' with 'economic value'. That is, measurable value is predominantly estimated as a combination of capital and labour costs associated with water management activities while all other considerations, such as the 'ecological needs' of the water source or the cultural value of a water body for a given community, are grouped in the residual and mostly rhetorical category of 'intrinsic value' (see for instance: Rogers, Bhatia, and Huber, 1998: 6–14; Rogers, de Silva, and Bathia, 2002; Connor, Cosgrove, Rast, and Winpenny, 2009: 56–57).

From a long-term perspective, valuation is a component of rationalization processes, and therefore the interplay between coexisting rival and often incompatible rationalization processes is characterized by unstable balances between alternative forms and principles of water valuation. In current debates this interplay is often casted in the form of confrontations between diverse or even irreconcilable positions. For instance, ecological rationalities in their diverse strands may foster understandings of water's value that transcend the notion of water as a limitless economic resource and give centrality to such considerations as ecological limits, unsustainability, common, trans-specific and trans-temporal rights, or cultural concerns (e.g. Martínez Gil, 2003; New Water Culture Foundation, 2005). In contrast, capitalist rationalities, also prone to internal tensions and contradictions, may centre the valuation of water on such considerations as economic efficiency, cost-benefits, the existence of private property rights over water, the full privatization of water sources and water-based services, and the creation of water markets (e.g. Segerfeldt, 2005). The complex and interwoven character of these processes is illustrated by the fact that in recent years some strands of ecological and capitalist rationalities have jointly nurtured the emergence of powerful frameworks that converge with and foster the capitalist commodification of water, and the environment more generally. This 'unholy alliance' took recently a new turn with occasion of the United Nations Rio+20 Earth Summit in Brazil on 20–22 June 2012, which was centred on the proposals for a new 'Green Economy' to save the planet (UN, 2012b). The UN debates about the project for a 'green capitalism', which included proposals to foster water commodification in several fronts, were denounced and rejected by a broad coalition of social movements, indigenous peoples, and other actors, a confrontation that will likely continue for years to come (see among others: Climate Connections, 2012; Council of Canadians, 2012).

These examples illustrate the contradictory nature of water valuation processes, which could be further illustrated by incorporating the multifarious perspectives of water's value grounded on a range of cultural, class, ethnic, gender, and other social divisions on which there is a profuse literature (e.g.: Akpabio, 2011; Ball, 1999; Berry, 1998; Faruqui, Biswas, and Bino, 2001; Boelens and Dávila, 1998; Hue, 2006; Hundley, 1996; Ghosh, 2007; Gyawali and Dixit, 2001; Matsui, 2005; Meyer, 1984; Moraes and Perkins, 2007; Moss et al., 2003; Neiburg and Nicaise, 2009; Pritchard, 2004; Trentmann and Taylor, 2006; Sementelli, 2008; Williams and Florez, 2002). Thus, although the main dynamics of ever expanding capitalist commodification processes keep driving the reduction of water to the function of raw material, production factor, and private, marketable economic good, the persistence of alternative rationalities finds expression through a complex, often incommensurable, array of social values, functions, and material interests in an always unstable configuration of power balances. This highly dynamic and evolving configuration of rival and often mutually exclusive rationalities underpins the slow, incomplete, and fragmentary character of capitalist rationalization processes in relation to water.

Conclusion

In this article I aimed to discuss the proposition that water, and more specifically the freshwater component of the hydrosphere on which all life depends, has not yet been converted into a capitalist commodity. The limited length of the article did not allow the incorporation of enough empirical information to possibly persuade critical readers, but I made an effort to ground my analysis on the available empirical evidence and have guided the reader to authoritative sources where the most up-to-date information about the state of the world's water can be consulted. However, as explained in the text, even the most authoritative sources of empirical information recognize that the state of knowledge about water in the planet, even in the most advanced capitalist countries, is inadequate, incomplete, 'akin to islands of knowledge in a vast sea of unknowns' as one of the most recent reports has stated (UNESCO-WWAP, 2012: 33).

This in fact is one of the reasons why I argue that water has not yet been transformed into a commodity, if we use the concept in strict sense. For sure, the capitalist commodification of water is an on-going historical process that has increasingly engulfed wider areas of human activity. However, it is incomplete and punctuated by obstacles, delays, and often even significant setbacks, and the lack of precise knowledge about very basic facts related to water government, management, and use is a major reason to back up the argument that water, with few exceptional situations, has not yet become a commodity. Capitalist rationality is predicated on precise knowledge that allows the calculability and predictability required for the functioning of capitalist commodity markets, but this essential requirement is largely missing in the case of water and water-related activities even in the core capitalist countries.

I adopted a long-term sociological perspective in order to provide a structured framework for the analysis of information and empirical materials that are necessarily gathered from a wide array of disciplinary and non-academic sources given the nature of the central element of my study: water. In this regard, Norbert Elias' insights about the 'triad of basic controls' provides a valuable framework to understand the interlinkages between the different dimensions and processes characterizing water-related human interactions. By examining capitalist rationality as existing alongside, interwoven with alternative rationalities that emerged in the course of human history through the control mechanisms established by humans for harnessing, managing, and allocating water, it is possible to cast light on the significance that non-capitalist rationalities as well as non-rational elements such as mythical thinking, quasi religious doctrinal beliefs, and nostrums derived from short-term (often short-sighted) party interests have for understanding why even in the advanced stage of human development represented by twentieth-first century capitalism, water, the fundamental element of life, has not yet been transformed into a commodity.

As discussed earlier, although most human societies have allowed the vending of water, this has seldom taken the form of fully commodified production and consumption of water products, in strict terms. Actually, the forms of control developed in the course of human history for the government and allocation of freshwater for essential uses were grounded on normative principles that have survived until today whereby common or public forms of water ownership and use were given priority over private forms, even in circumstances where private property rights over water were allowed to exist. Also, most societies have also formalized in one way or another the principle that water for essential –not just human but also animal– uses cannot be denied to anyone even if they cannot pay for it. [\[13\]](#) [\[13\]](#) It can be argued that the forms of social control historically established for the regulation of water for essential human uses in most societies have taken more often the form of a gift, or of a common, social or public good rather than that of a privately owned commodity that can be traded in markets. [\[14\]](#) [\[14\]](#)

Certainly, this is not denying that in many cases water has been treated as a commodity, even in the strictest sense, as in the case of commercial bottled water in contemporary society. Also, water is an integral component of any process of commodity production and exchange, but even then it is systematically incorporated as a gratis raw material or pollution sink, seldom as a privately-owned commodity exchanged in capitalist markets. The notion of capitalist water markets remains, by and large, an expression of desire and a political project rather than an empirical fact.

I agree that there is little if any room to doubt that the commodity mode of production dominates the world system, but this does not mean that everything that is currently produced and exchanged by human beings has taken the commodity form in strict sense, that is, is produced and exchanged as private property in capitalist markets. The case of water is an outstanding example. It is unsurprising that contemporary promoters of speculative capitalism tend to express with crystal clarity the fact that for the most part the world's water remains un-commodified. For them, the hydrosphere, and particularly its freshwater component, constitutes a new horizon for capitalist development: they argue that water is evolving to become the 'next commodity' (Dugan et.al., 2006; Geman et. al., 2007; Hudson, 2007; Royal Bank of Scotland, 2008). However, they may be too optimistic, and are most likely unaware of the significant obstacles faced by the capitalist rationalization process in this particular field of human endeavour. This includes not least the protracted social struggles of resistance against further capitalist encroachment driven by alternative rationalities grounded on entirely different principles and mechanisms of social control.

For the above reasons, I argue that while at the theoretical level it can be assumed that the overarching dynamic of water control and management activities in the world today is driven by the capitalist commodification process, at the empirical level we can only formulate the problem in the form of research questions such as: to what extent, where, and how has water become a commodity? To what extent are activities such as the commercial production of bottled water, the abstraction of surface water, the transportation of Artic icebergs, or the pumping of fossil underground aquifers underpinned by capitalist rationality and governed by the rules of capitalist commodity markets? As I have argued in this article, although the answers to these and many other questions emerging from the analysis of the incomplete and fragmentary character of the process of capitalist rationalization, and particularly the processes of valuation and commodification, are far from straightforward, it is probably safe to defend the argument that, in strict sense, water has not yet become a commodity.

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Biography

José Esteban Castro is Professor of Sociology at Newcastle University, United Kingdom. He was previously a Research Associate at the School of Geography and the Environment at Oxford University, Lecturer in Development Studies at the London School of Economics and Political Science, and Lecturer in Political Ecology at University College London. He was born in Argentina and has an interdisciplinary background in social science. Castro obtained the title of BA and Lecturer in Sociology from the University of Buenos Aires (1983–1988), studied for a BA in Psychology at the same university (1984–1990), has a Masters in Social Sciences from the Latin American Faculty of Social Sciences in Mexico (1990–1992), and a DPhil in Politics from Oxford University (1993–1998).

Notes

1. The article is based on research carried out in the course of several projects, mostly in Europe and Latin America. These include the PRINWASS project (www.prinwass.org – 2001–2004) that examined the politics of water services privatization in nine countries of Africa, Europe and Latin America, which I coordinated. This was an interdisciplinary project bringing together expertise from the social and the technical sciences that adopted a systematic comparative approach and deployed a mixed methodology featuring secondary data analysis, small surveys, documentary evidence, workshops, and detailed case studies including in-depth interviews with key actors. I have continued the study of water commodification through my on-going work coordinating the international research networks GOBACIT (www.gobacit.org – 2005–to date) and WATERLAT (www.waterlat.org – 2009–to date). [\[#N1-ptr1\]](#)
2. Freshwater accounts for around 2.5 per cent of the total amount of water in the planet, and only a small fraction of it is available for human use. [\[#N2-ptr1\]](#)
3. For a succinct but comprehensive and empirically-grounded discussion see McNeill, 2000: 118–191. For highly detailed empirical information about the state of world's water, see UNESCO's triennial World Water reports (UNESCO-WWAP, 2006, 2009, 2012). [\[#N3-ptr1\]](#)
4. The obvious exemption to the rule is the commercialisation of bottled water, which by now is well established worldwide and has been termed by some the 'pure commodity' (Wilk, 2006; see also Opel, 1999). For reasons of space I have not dealt here in detail with the particular case of water services privatization, which is the object of a specific literature (e.g. Bakker, 2004; 2010; Castro, 2008; 2010; Goldman, 2007; Laurie, 2007; Swyngedouw, 2005). [\[#N4-ptr1\]](#)
5. This statement may be intriguing for the reader unfamiliar with specific debates about contemporary water management. Also, reading works mentioned in this article like John McNeill's chapters on the hydrosphere (McNeill, 2000), or UNESCO's comprehensive World Water Reports (UNESCO-WWAP, 2006, 2009), just to give examples of sources that I have considered in my argument, may give the impression that there is no shortage of the kind of precise information based on scientific knowledge being discussed. But as the statement from UNESCO-WWAP cited in this paragraph (2009: xi) suggests, there is an enormous gap between the knowledge available about broad historical trends in water consumption, pollution, and other aspects, and the kind of precise knowledge and information required for the calculable and predictable control of water and water-related human interactions characteristic of would be commodity water markets grounded on capitalist rationality. As it was bluntly put by a recent assessment of England's privatized water and sanitation sector carried out by pro-market analysts: 'deficiency in information does not derive principally from the kind of asymmetries of information beloved of economic theorists [...]. The problem is not so much one of asymmetric information, but rather one of general ignorance. [...] The general point is that, particularly in circumstances where the supply of information is impoverished for want of effective discovery processes [...] long-run forecasts are simply stories, based on extremely limited information sets. How things will turn out, however, will depend upon all sorts of factors, and upon interactions among those factors, in ways yet to be discovered. There is no basis for expecting any close relationship between the two (the story and the unfolding reality). Stories, narratives and fairy tales have their uses – for example, in providing comfort in an uncertain world, sticks to beat with, and covering for backs – but in circumstances where information is so limited, we suggest that a focus on developing processes that will start help rectify the "general ignorance", and that will provide greater flexibility and adaptability in the face of evolving challenges, is likely to be more productive than the pretence of knowledge that typically underpins long-run planning' (Yarrow et. al., 2008: 14, 69–70). It is worth remarking that the English experience is one of the preferred examples given in the literature about supposedly effective water management systems based on market principles (e.g.: Rouse, 2009). [\[#N5-ptr1\]](#)
6. As a former UN officer and enthusiastic advocate of water privatization put it, 'the most significant act of privatisation may be the granting of property rights over water' (Lee, 1999: 93). [\[#N6-ptr1\]](#)
7. As a former UN officer and enthusiastic advocate of water privatization put it, 'the most significant act of privatisation may be the granting of property rights over water' (Lee, 1999: 93). [\[#N7-ptr1\]](#)
8. However, the basic tenets underpinning the assumption that Nature is a free gift for humans runs through the main strands of the Western intellectual legacy and some of its central aspects can be traced back to the Greek and Judeo-Christian traditions. For a recent review of the on-going debates about the intellectual origins of this notion of Nature as a free gift to humans, see for instance Dunlap, Buttel, Dickens, and Gijswijt, 2002; Redclift and Benton, 1994. [\[#N8-ptr1\]](#)
9. Although the total amount of water in the planet remains the same, the relative quantity of available freshwater of a quality suitable for sustaining the biosphere has been severely affected in many regions and the situation is worsening in the face of increasing abstraction, pollution, and overall deterioration of freshwater sources. In the words of UNESCO's Third World Water Report 'The pattern and intensity of human activity have disrupted – through impacts on quantity and quality – the role of water as the prime environmental agent. In some areas depletion and pollution of economically important river basins and associated aquifers have gone beyond the point of no return, and coping with a future without reliable water resources systems is

now a real prospect in parts of the world' (UNESCO-WWAP, 2009: xxiii). See also McNeill (2000), pp. 118–191. [↗ \[#N9-ptr1\]](#)

10. An indicator of this characteristic is water wastage caused by outdated or faulty infrastructure. A recent report on the situation of the 27 countries of the European Union showed that in domestic and public water use which account for 17 per cent of total water abstractions, it would be possible to save up to 50 per cent of water currently being wasted through leaky pipelines and other problems. In agriculture, accounting for 24 per cent of total abstractions, savings could be between 15 and 60 per cent, depending on regional and sector conditions. Industry uses around 15 per cent of total abstractions, and it is estimated that between 15 and 90 per cent of that water could be saved (Dworak et. al., 2007: 6–7). [↗ \[#N10-ptr1\]](#)
11. On the debate about the internal contradictions of the capitalist rationalization process in relation to the environment, see among others: Murphy, 1994; Schnaiberg and Gould, 1994. [↗ \[#N11-ptr1\]](#)
12. For further details see UNESCO-WWAP's triennial reports on the state of the world's water (2006, 2009); see also McNeill's chapter on the history of global water pollution (2000: 118–148). Discharging untreated sludge into the open seas has been standard practice even for rich countries until recently (e.g. Whitelaw and Andrews, 1988), and still prevails worldwide. Also, one of the major impacts affecting the world's water bodies is eutrophication resulting from massive discharge of untreated effluents (e.g.: Khan and Ansari, 2005). [↗ \[#N12-ptr1\]](#)
13. Of course, the formal principles have not been matched by the actual universalization of the access to water, which remains one of the most extreme forms of social inequality and injustice worldwide. I address this particular topic elsewhere (Castro, 2008; 2009). [↗ \[#N13-ptr1\]](#)
14. This principle has been recently sanctioned for the first time -and after long and embittered debates- by the United Nations General Assembly, which declared that '[s]afe and clean drinking water and sanitation is a human right essential to the full enjoyment of life and all other human rights' (UN, 2010). It is worth mentioning that 41 countries abstained from the vote, most of which had openly opposed the proposal to declare water a human right during many years of debate. See: Amnesty International, 2003. [↗ \[#N14-ptr1\]](#)