



**Final Paper**  
**LL.M. in International**  
**Environmental Law and Natural Resources Law**

**The International Legal Framework Relating to Water**  
**with an Emphasis on Sustainable Development and the**  
**Millennium Development Goals**

Victoria Vénus Orlianges

Supervisor: Aðalheiður Jóhannsdóttir  
& Davíð Örn Sveinbjörnsson

Lagadeild  
Félagsvísindasvið

30 ECTS

September 2015



HÁSKÓLI ÍSLANDS

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## **Abstract**

This thesis analyzes the international legal framework relating to water. As population growth and climate change are increasing the pressure put on global water resources, water protection and management is of paramount importance for life on earth. Water management and sustainable development are notions fundamentally intertwined. Target 7C of the United Nations Millennium Development Goals embodies the fact that water is essential for human development and environmental sustainability. The international legal framework relating to water management focused for most of its history on allocation issues and use of transboundary water resources. Only recently, international instruments have addressed water conservation and protection issues. As it is today, the international legal framework relating to water establishes global standards of protection and sets common procedural requirements that help better manage the resource. But these minimal standards are basic and need to be further implemented by states or regional organizations to protect in practice water resources. Furthermore, water plays a great role in other types of crisis. Namely, the intensification of extreme weather events, such as droughts, affects significantly some region of the world and the stability of their political institutions. International water law by developing a framework of minimum standards that help better manage water resources contributes to build global peace and security. In a word, the need for stronger water governance is now well acknowledged but the adoption and implementation of effective and global legal instruments is still a major issue.

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## List of Abbreviations

<b>BRICS</b>	Brazil, Russia, India, Indonesia, China, and South Africa
<b>CBD</b>	1992 Convention on Biological Diversity
<b>COP</b>	Conference of the Parties
<b>EIA</b>	Environmental Impact Assessment
<b>ICJ</b>	International Court of Justice
<b>IEA</b>	International Energy Agency
<b>IIL</b>	Institute of International Law
<b>ILA</b>	International Law Association
<b>ILC</b>	International Law Commission
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IRBM</b>	Integrated River Basin Management
<b>IWRM</b>	Integrated Water Resources Management
<b>OECD</b>	Organization for Economic Co-operation and Development
<b>PCIJ</b>	Permanent Court of International Justice
<b>UN</b>	United Nations
<b>UNECE</b>	United Nations Economic Commission for Europe
<b>UNEP</b>	United Nations Environment Program
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNGA</b>	United Nations General Assembly
<b>UNICEF</b>	United Nation Children's Fund
<b>UNWC</b>	1997 United Nations Watercourses Convention
<b>WFD</b>	2000 European Union Water Framework Directive
<b>WHO</b>	World Health Organization
<b>WSSD</b>	World Summit on Sustainable Development



## Part I. Water at the Center of the Notion of Sustainable Development

### 1. Introduction

*“The difference between what we do and  
What we are capable of doing would suffice  
To solve most of the world’s problems.”*  
Mahatma Gandhi<sup>1</sup>

On Earth, the most vital and widely shared resource is water. Water is at the center of everything: it provides drinking water and basic sanitation, good level of hygiene, enables agricultural production, industrial activities, and recreational purposes. In a nutshell water is life. Every human being on Earth needs water to live, every society needs water to develop, and every ecosystem is dependent on the quality and availability of water resources. Historically water was seen as a given, an inexhaustible resource, which is generally the case for natural resources. Water management neither reflected its value, for instance still today the price of one liter of water does not reflect the true cost of its production. The increasing pressure put on water by industrial society and poor management have to face a reality: the amount of water on earth is finite. Water scarcity is already a reality for many regions of the world. Indeed, 40% of the world’s population is subjected to water stress.<sup>2</sup> As the United Nations indicate, if we do not change our patterns of consumption, by 2025 water stress is going to concern two-thirds of the world.<sup>3</sup> In Africa alone, 75 to 250 million people may be subjected to high water stress within five years.<sup>4</sup> Today, water management is subject to an increasing complexity. The past threats of increase water use and declining water quality because of human-induced sources of pollution

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<sup>1</sup> ‘Young India’ (Volume 1, Issue 52, 1919).

<sup>2</sup> **Definition of water stress** : a measure of the total, annual average water demand of “blue water” in a river basin compared with the annual average water available in that basin. Often the resulting ratios are grouped into four categories: less than 10% = no stress; 10-20% = low stress; 20-40% = medium stress; and more than 40% = severe stress. Source: OECD, *Environmental Outlook to 2050 – The Consequences of Inaction* (OECD Publishing 2012) 214, available at: <http://dx.doi.org/10.1787/9789264122246-en>, accessed 10 June 2015.

<sup>3</sup> United Nations World Water Assessment Programme, *The United Nations World Water Development Report 3: Water in a Changing World* (2009) 36.

<sup>4</sup> *ibid* 19.

remain present. While new challenges have led their way into the picture, including population growth, between 1959 and 2009 water use has been multiplied by three;<sup>5</sup> and climate change, which disturbs water cycles, alters the quality of water and enhance the frequency of extreme weather events.

The United Nations' Millennium Development Goals (MDGs)<sup>6</sup> and the 2002 World Summit on Sustainable Development<sup>7</sup> have raised access to clean water as a world priority. The management of water resources is influenced by every other aspect of governmental policies such as economy, agriculture, industry, land planning, the environment. Management of water resources and sustainable development are notions fundamentally intertwined. World leaders committed to sustainable development by adopting the MDGs at the United Nations Millennium Summit in 2000. Then, in 2012 at the United Nations Conference on Sustainable Development (what has been called Rio+20),<sup>8</sup> world leaders proclaimed their engagement through an agenda for sustainable development for the period post-2015 in the outcome document *The Future We Want*,<sup>9</sup> where it is clearly emphasized that "water is at the core of sustainable development as it is closely linked to a number of key global challenges".<sup>10</sup> Target 7C of the MDGs clearly defines water as a determinant factor for development and the sustainable management of the environment. Water resources management helps eliminate poverty, supports education, reduce child mortality, and helps fight water-borne diseases.<sup>11</sup> Lack of adequate access to drinking water or basic sanitation is an issue that over a billion people are facing today.<sup>12</sup>

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<sup>5</sup> United Nations World Water Assessment Programme, *The United Nations World Water Development Report 3: Water in a Changing World* (2009) 101.

<sup>6</sup> United Nations, *United Nations Millennium Declaration* (New-York City 2000) (A/RES/55/2) available at: [http://www.un.org/en/ga/search/view\\_doc.asp?symbol=A/RES/55/2](http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/55/2).

<sup>7</sup> United Nations, *Report of the World Summit on Sustainable Development*, (Johannesburg South Africa 2002) (A/CONF.199/20\*) available at: [http://www.un.org/jsummit/html/documents/summit\\_docs/131302\\_wssd\\_report\\_reissued.pdf](http://www.un.org/jsummit/html/documents/summit_docs/131302_wssd_report_reissued.pdf).

<sup>8</sup> United Nations, *Report of the United Nations Conference on Sustainable Development* (Rio de Janeiro 2012) (A/CONF.216/16) available at: <http://www.uncsd2012.org/content/documents/814UNCSD%20REPORT%20final%20revs.pdf>.

<sup>9</sup> United Nations, *The Future We Want*, United Nations Conference on Sustainable Development (Rio de Janeiro, Brazil 22 June 2012) (Rio+20) available at: <https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf>.

<sup>10</sup> *ibid* 32.

<sup>11</sup> UNESCO International Hydrological Programme, *Water in the post-2015 development agenda and sustainable goals* (Paris 2014) 2.

<sup>12</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment*. (Oxford University Press 2009) 535.

The international aspects of water management are various. Historically, international water law has focused on rules and principles for allocating water supply in international watercourses between co-riparian states.<sup>13</sup> Indeed, water allocation can be a thorny issue since many watercourses are shared between two or more countries. Conflicts of interests in that regard have aroused tensions in some regions of the world. However, environmental and sustainability concerns have been met incidentally, but a growing attention for these issues is spreading among the international community and international law progressively reflects these changes.<sup>14</sup> Namely, the issue of water quality is quite delicate because most international agreements dealing with water allocation do not tackle this subject while the quality of water determine if and how water will be used, hence being of paramount importance when addressing allocation issues.

To address these issues, efforts have been made to incorporate both water quality and quantity; and to integrate land use planning and water management as water pollution comes mostly from land based sources such as agricultural or industrial activities. Such solutions have been gathered in the concept of Integrated Water Resources Management (IWRM). Particularly relevant at first sight, this principle has struggled to be implemented. Indeed, the integration of multiple policy fields such as land use planning, agricultural supervision, regulation of industrial discharges, and water management, requires consequent efforts from states and in the case of international cooperation the transfer of sovereign powers. In that respect, the European Union has been quite successful in implementing the principle of IWRM, thanks to its unique regional economic integration.

At the international level, the main legal instrument is the 1997 Convention on the Law of Non-Navigational uses of International Watercourses,<sup>15</sup> which deals with water allocation issues, the protection of water quality and encourages state cooperation in water management. Various other global instruments compose the international legal architecture relating to water. This international legal framework establishes the minimum standards and requirements that should constitute the basis

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<sup>13</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 536.

<sup>14</sup> *ibid* 536.

<sup>15</sup> United Nations Convention on the Law of Non-Navigational Uses of International Watercourses (New York, 21 May 1997, in force 17 August 2014) UNTS I-52106 (hereinafter: UN Watercourses Convention or UNWC).

of state practice and state cooperation. This thesis focuses on international legal instruments that regulate at the global level water management, in the intent to measure the relevance and efficiency of these instruments in the context of a complex water situation.

At the regional level, many bilateral agreements and treaties that manage more or less efficiently transboundary water resources have been adopted. Regional cooperation agreements constitute a considerable part of the legal architecture relating to water. However, in that context, states are mainly concerned to adopt agreements that all parties see as equitable and are willing to implement. Thus, when allocating water resources, the notion of equitable utilization is shaped according to their own opinion, and the preservation of the environment is not automatically put on the forefront. In that respect, this thesis will not intend to conduct an exhaustive study of regional agreements, but rather to cite few that are of some relevance to illustrate the local implementation of international standards.

Accordingly, the main goal of this thesis will be to analyze if the international legal framework, as it is today, is sufficiently developed to meet the challenges the water resource is facing. By doing so, this thesis will consider whether international water law helps building global peace and security; and evaluate to what extent international law relating to water supports the UN Millennium Development Goals.

To respond to this questioning, the thesis will be developed in a three folded-way: first, the state of the water resource today and the drivers of pressure will be described so as to acquire a broad overview of the factual situation (Part II); secondly, an assessment of the international legal framework will allow to evaluate if it meets the challenges the water resource is facing (Part III); lastly, an analysis of the impacts of improved water resources management on development will be conducted, with a special emphasis on the global progress towards achieving the UN's Millennium Development Goals (Part IV).

## **Part II. General Overview on the State of Water Resources and Drivers of Pressure**

### **2. State of Freshwater Resources**

The state of water resources on earth has been subjected to various dynamics over the last decades. In this respect, it is necessary to conduct an analysis of the recent trends affecting the resource so as to have a comprehensive overview of the current situation.

#### **2.1 Facts and Recent Trends about Water**

One of the greatest challenges for international policy making is linked to water management and the protection of water quality. At the global scale, there is an increasing demand for freshwater resources and the availability of the resource varies greatly from one country to another. According to a 2015 United Nations' factsheet, today 780 million people do not have access to freshwater and 2.5 billion do not have access to basic sanitation services.<sup>16</sup> It is estimated that some 6 to 8 million deaths every year are caused by disasters and water-related diseases. Ninety percent of all wastewater is still poured into local water streams in developing countries. Medium to high water stress concerns approximately 47 countries of the world.<sup>17</sup> According to a report by the Organization for Economic Co-operation and Development (OECD), each year it is \$75 billion that are needed to develop water infrastructure in addition to maintenance costs of existing systems, while only \$3 billion are allocated to the water sector.<sup>18</sup>

A joint report by the World Health Organization (WHO) and the United Nation Children's Fund (UNICEF) shows that in developing countries, efficient and steady provision of water is still a problem to be solved.<sup>19</sup> As far as sanitation is

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<sup>16</sup> UN-Water 'United Nations International Year of Water Cooperation: Facts and Figures' (UN Water 2015) <<http://www.unwater.org/water-cooperation-2013/water-cooperation/facts-and-figures/en/>> accessed 23 June 2015.

<sup>17</sup> OECD, 'Improving Water Management' (OECD Publishing 2003) (hereinafter OECD Improving) 10.

<sup>18</sup> *ibid* 15.

<sup>19</sup> WHO/UNICEF, *Progress on Sanitation and Drinking Water – 2013 Update* (WHO/UNICEF 2013) (WA 670) 14.

concerned, many cities are lacking proper sanitation facilities. The 2002 World Summit on Sustainable Development (WSSD) held in Johannesburg, put the issues of water and sanitation on the forefront, aiming at reducing by 50% by 2015 the number of people with no access to safe drinking water and basic sanitation.<sup>20</sup> Issues relating to the manipulation of water (like dams, canal, etc.) became highly criticized in the 1970s with the development of the environmental movement. Indeed, not only did such works raise environmental issues but also social justice concerns when for instance dams led to the displacement of local population.<sup>21</sup> As a result, today, the conducting of water infrastructure projects is subject to much conditionality among which demanding Environmental Impact Assessment (EIA) requirements.

Developing wastewater treatment plans has been a great concern for developed countries in the past few years so as to reduce sewage and industrial discharges into their water. Developed countries made also particular efforts in increasing water efficiency and cleaning highly polluted river basins.<sup>22</sup> In the same dynamic, an increasing number of countries have adopted Integrated Water Resources Management (IWRM), which integrate both water quality and quantity considerations.<sup>23</sup>

On the one hand, water can be seen as a public good, and in that scenario populations around the world are entitled to access to safe drinking water. Some argue that access to water constitute a new human right.<sup>24</sup> On the other hand, water can be seen as a precious economic good and its price would reflect the true cost of its production. In developing countries, international assistance agencies have encouraged water privatization to better manage the resource but this practice has shown mixed results. Recovering the cost of water production and service infrastructures constitutes a great economic burden that the poorest societies can't bear. Furthermore, developing IWRM ask for strong institutional support that developing societies often lack.<sup>25</sup>

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<sup>20</sup> WSSD, Plan of Implementation, Section 7.

<sup>21</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 169.

<sup>22</sup> OECD, 'Improving Water Management' (OECD Publishing 2003) (hereinafter OECD Improving) 10.

<sup>23</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 170.

<sup>24</sup> International Journal of Water Resources Development, 'The United Nations Concept of Water as a Human Right: A New Paradigm for Old Problems?' (Volume 21 Issue 2, 2005) 273-282. And see: Scanlon, John, Cassar, Angela and Nemes, Noémie, 'Water as a human right?' (IUCN 2004) 3.

<sup>25</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 170.

The regulation of both water demand and supply is a difficult enterprise. Intensive manipulation of water through dams and canals is costly. In addition, water service infrastructure providing storage and transportation of the resource can be upscale compared to the economic value of water in one point. Traditionally, water services are state run in the pursuit of general public interest.

In many countries, water management is not controlled through pricing but rather through state regulation. As a result, in most cases, the price of water does not reflect the cost of services and the scarcity of the resource. Developed countries have begun to measure water use (water metering) to reallocate water from one use to another, but this practice continues to be resisted.<sup>26</sup>

## 2.2 Groundwater Resources

Groundwater resources constitute the most important freshwater resource on earth. It represents 97% of the planet's readily accessible freshwater resources.<sup>27</sup> The OECD estimates that groundwater resources amount to 10.5 million km<sup>3</sup>.<sup>28</sup> Groundwater resources are clean, stable, economically efficient resources that play a great role in regions that do not possess large supplies of surface water like Africa. Groundwater is also a substantial source of drinking water, which explains that tensions surround its allocation. As a 2015 report on water published by UN Water – a specialized UN program for water – highlights, 2.5 billion people rely on groundwater resources to meet their basic daily water needs.<sup>29</sup> Indeed, 50% of the worldwide population relies on groundwater resources for drinking needs and the resource accounts for 43% of irrigation needs. The same report points out that groundwater resources are diminishing and that 20% of the aquifers are in situation of over-exploitation.<sup>30</sup> This diminution of the supply causes serious threats such as land subsidence and saltwater intrusion. The 1997 UN Watercourses Convention does not deal directly with groundwater but covers it to the extent of its linkage to surface water.

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<sup>26</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 170.

<sup>27</sup> *ibid* 170.

<sup>28</sup> OECD, 'Improving Water Management' (OECD Publishing 2003) (hereinafter OECD Improving) 220.

<sup>29</sup> UN Water, *Water for a Sustainable World - The United Nations World Water Development Report 2015* (UNESCO/ World Water Assessment Program 2015), 13.

<sup>30</sup> *ibid* 13.

As a matter of fact, large bodies of aquifers are still not regulated at the international level. Two or more countries often share groundwater aquifers. Hence, poor management or even depletion of aquifer supplies in one state affects the others. The geological character of the resource – circumscribed under the earth – makes it less easy to understand, regulate and protect it. Groundwater pollution is harder to mitigate.<sup>31</sup> The phenomenon of salinization that is spreading with climate change is a particular threat to groundwater resources. Among all the international agreements managing shared water resources, only two of them – the agreement on the Jordan River and the U.S.-Mexico Agreement – are regulating groundwater supplies.<sup>32</sup>

The International Law Commission (ILC) focused on regulating transboundary groundwater after the adoption of the 1997 UN Watercourses Convention. It appeared that the ILC changed the wording from “shared” to “transboundary” since some countries expressed worries that the denomination “shared” would refer to the “shared heritage of mankind” or to conceptions of shared ownership.<sup>33</sup> The question was raised whether the principles of equitable use and reasonable utilization, adopted for the allocation of surface freshwaters, should apply to groundwater management.<sup>34</sup> Some countries have argued that groundwater aquifers should be regulated on a case-by-case basis, since some of them are not renewable and further restrictions need to be taken. However, the ILC Draft Articles on the obligation not to cause significant harm received a broader support from states. Some of them even proposed to suppress the adjective “significant” because of the fragility of some groundwater aquifers in comparison with surface water.<sup>35</sup>

Groundwater aquifers constitute a crucial element of water resources on earth, their regulation and protection through international environment law is of paramount importance and plays a great role in promoting access to safe drinking water.

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<sup>31</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 170.

<sup>32</sup> *ibid* 171.

<sup>33</sup> *ibid* 171, referring to: Para. 3, Second Report on Shared Natural Resources: Transboundary Groundwaters by Chusei Yamada, Special Rapporteur, ILC, 56<sup>th</sup> session.

<sup>34</sup> *ibid* 171.

<sup>35</sup> *ibid* 171.



### 2.3 Transboundary Water Resources

One of the particularities of the water resource is that in many cases it is shared between two or more countries. As a result, allocating the resource has been a difficult task for international law. The planet counts 263 river basins, among which 87 are shared by more than two countries, and 19 are controlled by more than five states. During the past fifty years, 295 international water agreements were signed for only 37 disputes involving violence.<sup>36</sup> As Louka highlights most of the disputes concern allocation of water quantity or water infrastructure.<sup>37</sup> Treaties and the institutions they put in place, which are mainly river basin commissions, played a significant role in alleviating this phenomenon. Furthermore, the fact that the relations between coriparian states are better when the basin fall inside the international regulatory framework has to be welcomed.<sup>38</sup>

To assess the global state of freshwater resources on earth, an analysis of the main drivers that affect water supply and water quality gives insights of the situation in its long-term perspective.

### 3. The Drivers of Pressure

Today and in the decades to come, climate change and global population growth combined with changing lifestyle patterns are the main drivers of pressure on water resources. Water use has greatly evolved over the last decades and projection scenarios made available by international organization show that this trend will well continue. Approximately, 3,5 planets Earth would be required for the world's population to live through standards of living of the average European or North American.<sup>39</sup> The augmentation of the world population of 2 to 3 billion people over the next 40 years will result in an increase of food demand of 50% by 2030 and 70%

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<sup>36</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 172. Referring to: Meredith A. Giordano and Aaron T. Wolf, *The World's Freshwater Agreements: Historical Developments and Future Opportunities*, (Oregon State University/UNEP/FAO, 2002).

<sup>37</sup> *ibid* 172.

<sup>38</sup> *ibid* 172.

<sup>39</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 96.

by 2050.<sup>40</sup> These issues are fundamentally intertwined: obtaining an increasing agricultural output means consuming more energy and water, which puts additional pressure on the resource and tighten the competition among users. Yet water availability projections expect a decrease in many regions of the world. Population dynamics and climate change constitute the new challenges for water, intensifying this complex situation and increasing the financial burden over populations.<sup>41</sup>

### 3.1 The Evolution of Water Use

Water management is subject to an increasing complexity and a growing financial burden. The past threats of increase water use and declining water quality because of human-induced sources of pollution remain present. While new challenges have led their way into the picture, including population growth and climate change.<sup>42</sup>

In the past decades, great efforts have been done, increasing global access to domestic water supply, which helped five developing regions to reach the drinking water target of the Millennium Development Goals.<sup>43</sup> Nonetheless, sanitation is still a present challenge for lots of countries, mostly in Sub-Saharan Africa, and some rural areas are fighting for both water supply and sanitation.<sup>44</sup>

Growing population and increasing demand for agricultural products puts a steady pressure on water use. Since the 1970s the trend of population growth has slowed down but is still increasing, and the economic development of emerging market economies has given rise to a new driver of pressure on water: the shift in diet habits of these economies who tend to consume more meat and dairy product, which put additional pressure on water resources.<sup>45</sup>

On the broader scale, freshwater ecosystems are the nest of essential services for human well-being such as navigation, fisheries, and pastoral activities. These

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<sup>40</sup> J. Bruinsma, 'The resource outlook to 2050: By how much do land, water use and crop yields need to increase by 2050?' (FAO 2009) 33, available at: <http://ftp.fao.org/docrep/fao/012/ak542e/ak542e06.pdf>.

<sup>41</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 96.

<sup>42</sup> *ibid* 96.

<sup>43</sup> South-eastern Asia, Southern Asia, Western Asia, Latin America and the Caribbean, Eastern Asia. See: UNICEF/WHO, *Progress on Sanitation and Drinking Water – 2015 Update and MDG Assessment*, (UNICEF/WHO, 2015) 4.

<sup>44</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 96.

<sup>45</sup> *ibid* 96.

economic and recreational activities depend on direct use of water in healthy ecosystems. But inadequate policy attention on environmental services endangers the way various economic and social services use water.<sup>46</sup>

### 3.2 Demographic drivers

Great pressures are exerted on water resources through demographic processes. The demographic driver is a demand-side driver, influencing how much water we need. Among the various effects of population growth on water resources and environmental sustainability, the rapid improvement of lifestyles worldwide constitutes a serious threat. Population growth means increased water demand and pollution, which puts pressure on freshwater resources. Other dynamics such as migration and urbanization add pressure on local freshwater resources and ask for more water-related services.<sup>47</sup>

#### 3.2.1 World Population growth (1970-2060)

In 1970, the rural population of the world was almost twice as big as the urban population (2,337,900 billions people living in cities for 1,353,300 in rural areas) for an overall of 3,691,200 billions people.<sup>48</sup> In 1990 the rural and urban population were almost equivalent (3,033,000 billions people for the former and 2,287,800 for the later). In 2010, the world population doubled from the 1970 level, reaching 6,916,200 billions people, with a concentration of population within cities. It means that within 40 years the world population growth completely changed face, presenting a global population living mostly in cities and increasing exponentially. The projections for 2030 present an overall growth of nearly 25%, reaching 8,424,900 billions people composing the world population with 2/3 living in urban areas (5,060,800 billions people, for 3,364,100 living in rural areas).<sup>49</sup>

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<sup>46</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 96.

<sup>47</sup> *ibid* 29.

<sup>48</sup> FAO, 'FAOSTAT database Population domain' (Faostat3.fao.org, 2015) <<http://faostat3.fao.org/download/O/OA/E>> accessed 15 June 2015.

<sup>49</sup> UNESCO, *Facing the Challenges - Case Studies and Indicators* (World Water Assessment Programme: United Nations World Water Development Report 2015, UNESCO publication, Paris 2015) 34.

The world today is demographically divided; some regions like Africa and the Middle East have rapid population growth, while others like Europe and East Asia have rapidly ageing population. Population growth projections made by the United Nations highlight that following Eastern Europe, Australia, China, New Zealand and Western Europe show population growth trends that will be soon negative.<sup>50</sup> It is projected that by 2060 South Asia and Asia Pacific will also see shrinking populations. On the contrary, Sub-Saharan Africa and the Middle East are expected to maintain strong population growth rates well into the future. Population dynamics in particular areas of the world constitute most of the problem of water scarcity. Populations with high rates of growth are expected to be located in developing countries and mostly in areas already facing water scarcity. More precisely, Sub-Saharan Africa and South Asia will count for 30% each of the world's population growth between 2008 and 2100.<sup>51</sup> Such rates will have inevitably significant social and environmental consequences.

The demand for water has significantly increased over the past decades and is expected to continue still for the decades to come. Yet, the amount of freshwater on earth is finite. The OECD *Environmental Outlook Baseline* scenario expects the global water demand to upsurge in the decades to come: from 3 500 km<sup>2</sup> in 2000 (per capita per year) to 5 500 km<sup>2</sup> in 2050, which amounts to a 55% increase.<sup>52</sup> This significant increase is due to a growing demand from manufacturing, electricity, and domestic use. This phenomenon will intensify water stress in many basins of the world, especially in highly populated areas of developing countries. As a result, the OECD projects that the number of people living in stressed river basins is going to significantly increase, from 1.6 billion in 2000 to 3.9 billion in 2050, covering more than 40% of the world population.<sup>53</sup> According to these projections, three-quarters of these people will be located in the BRIICS.<sup>54</sup> Populations from South Asia, the Middle East and large parts of China and North Africa will suffer of severe water

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<sup>50</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 30.

<sup>51</sup> *ibid* 31.

<sup>52</sup> OECD, *OECD Environmental Outlook to 2050 - The Consequences of Inaction*, (OECD Publishing, 2016) 216, available at: <http://dx.doi.org/10.1787/9789264122246-en>.

<sup>53</sup> *ibid* 216.

<sup>54</sup> BRICS: Brazil, Russia, India, Indonesia, China, South Africa.

stress. The everyday consequences cannot be ascertained since they depend greatly on water management policies.

### *3.2.2 Rising Food Demand, Changes in Eating Habits, Increased Pressure on Agriculture*

Population growth associated with rapid global rise in living standards constitutes a significant threat to the sustainability of water resources and environmental services. According to the United Nations future global agricultural water consumption alone is expected to rise at least by 19% by 2050 if no technological progress or policy intervention are made.<sup>55</sup> The greatest driver of pressure on water resources is agriculture through both irrigation and food production, it accounts for 70% of global freshwater withdrawal.<sup>56</sup>

Furthermore, economic growth and individual wealth cause changes in eating habits; an increasing part of the world is shifting from starch-based diets to diets including meat and dairy, which require more water.<sup>57</sup> For instance, the production of 1kg of rice requires approximately 3,500L of water while 1kg of beef requires 15,000L.<sup>58</sup> In developing countries, heavy changes are taking place both on social and economic levels, millions of people are making their way out of poverty, which create new middle class eager for milk, bread, eggs, chicken and beef to supplement their traditional diets, which were less water-intensive.<sup>59</sup>

Actually, along with global population growth, the UN consider that living standard and consumption patterns constitute the main drivers of pressure on water resources. The world is growing but the world is also changing and a global standardization of lifestyle all around the globe is to be observed. In developing countries and countries in economic transition, standards of living rise steadily, so the

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<sup>55</sup> UN-Water, 'United Nations International Year of Water Cooperation: Facts and Figures' (Unwater.org, 2015) <<http://www.unwater.org/water-cooperation-2013/water-cooperation/facts-and-figures/en/>> accessed 9 June 2015.

<sup>56</sup> *ibid.*

<sup>57</sup> United Nations, 'Water and food security | International Decade for Action 'Water for Life' 2005-2015' (Un.org, 2015) <[http://www.un.org/waterforlifedecade/food\\_security.shtml](http://www.un.org/waterforlifedecade/food_security.shtml)> accessed 9 June 2015.

<sup>58</sup> Water Footprint, 'Product gallery' (Waterfootprint.org, 2015) <<http://waterfootprint.org/en/resources/interactive-tools/product-gallery/>> accessed 9 June 2015.

<sup>59</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 39.

demand for kitchen appliances, cars and other ‘luxury’ items increases equally.<sup>60</sup> The resources needed to produce, generate and operate them is also increasing, making – what has been called by the UN – the humanity’s environmental footprint rise significantly.<sup>61</sup> Even with the alleviating effect of technological innovations and cleaner energies, this trend poses great threats to the sustainable use of water resources.

In summary, living standards are linked to and reflect the evolution of economic development, technological innovations, the transformation of culture, population dynamics, the level of health, etc.<sup>62</sup> Alongside with population dynamics, the impact of climate change on water resources and management is global and disrupts profoundly the historical approach of water management.

### **3.3 Climate Change**

Scientific researches during the last decade confirmed the fact that climate change is human-induced. The alteration of water constitutes the major detrimental effect on both humans and the environment because of climate change.<sup>63</sup> Hence, alongside world population growth, climate change puts significant pressure on water resources. The particularity of climate change is that it constitutes a driver that exerts pressure on the supply of water directly, determining how much water we have. Climate change disrupts the hydrologic cycle and through it the quantity and quality of water resources. Climate change can also trigger lower flows in rivers, which in turn affects water availability and quality for the fauna and flora, drinking-water intake, and energy production (through hydropower and navigation). The consequences of extreme events due to climate change are materialized through serious crop losses, health problems, environmental catastrophe, which impact water resources.<sup>64</sup>

Climate change alters precipitation events, their timing, magnitude and duration. Mitigating climate change through reduction of greenhouse gas emissions,

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<sup>60</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 39.

<sup>61</sup> *ibid* 39.

<sup>62</sup> *ibid* 39.

<sup>63</sup> *ibid* 68.

<sup>64</sup> *ibid* 68.

the development of clean technology, and the protection of forests, constitute policies that have great impact over water supply and demand on the short and long term.<sup>65</sup>

### *3.3.1 Challenges Resulting from the Impact of Climate Change on Water Resources*

Water resources catalyze the impact of climate change on societies through many ways such as energy, agriculture and transport sectors. Climate change adversely affects the global hydrological cycle that causes various impacts and risks. The second Working Group of the Intergovernmental Panel on Climate Change (IPCC) released a report presenting the impacts of climate change on freshwater resources.<sup>66</sup> The report lists the main causes of change triggered by climate change that impact water, among them: increases in temperature and sea level, local changes of precipitation, changes in the variability of water quantities. Semiarid and arid areas are particularly fragile in facing such changes. Indeed, warmer water, stronger precipitation and lower flows in river, weaken water quality, which has significant consequences for ecosystems, human health and water services management and their cost. To face these growing uncertainties and to alleviate disastrous consequences on humans and the environment, the water sector has developed adaptation and risk management practices in some region of the world.

First of all, the IPCC study shows the parallel link between increasing greenhouse gas emissions and increase in freshwater-related disasters. Furthermore, when the Earth global temperature increases of one degree, it means that 7% of the world population will be subjected to a 20% decrease of renewable water resources.<sup>67</sup> In this respect, climate change will considerably reduce both renewable surface water and groundwater resources in the driest subtropical regions, which will intensify competition for water among users including actors from the agricultural and industrial fields. This phenomenon will alter water, energy and food security in many regions of the world.

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<sup>65</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 69.

<sup>66</sup> Intergovernmental Panel on Climate Change, *Climate Change 2014: Impacts, Adaptation, and Vulnerability* (WHO/UNEP, 214) 232.

<sup>67</sup> *ibid* 232.

The IPCC expects an increase in the frequency of floods hazards, especially in the South, Southeast and Northeast Asia, tropical Africa, and South America.<sup>68</sup> Greater exposure and vulnerability to global flood risk of the populations in these regions will increase socioeconomic losses. Moreover, according to the IPCC projection scenario, climate change is expected to intensify extreme weather events such as droughts by the end of the 21<sup>st</sup> century. It has to be noted that impacts of drought have gained in intensity due to the global increase water demand.

Climate change is projected to affect raw water quality through various factors, including: temperature changes; strong rain precipitation leading to increases of sediment, nutrients and pollutants loadings; poor dilution of pollutants in time of droughts; and difficult treatment operations during floods.

Climate change will have be a particular burden for poor population with low capacity of shock absorption, through extreme hydrologic events such as floods, storm surges and droughts.<sup>69</sup> Alleviating these effects on the most fragile human populations is one of the most pressing issues. In the long term, climate change policies are going to affect food security, energy security and land use, which are linked to water resources management and environmental sustainability. In this respect, climate change intensifies these vulnerabilities.<sup>70</sup>

Moreover, climate change affects greatly the planning of hydrologic systems for water managers since they cannot longer rely on historical statistics. Increased uncertainty has to be dealt with in policy development at every level: regional, national, local and company levels. Responding to new threats and opportunities linked to climate change and its impact on water resources is vital for the most remote rural areas as for the broader development agenda.<sup>71</sup>

### 3.3.2 Technological Innovations

Technological innovations have the potential to lower pressures on the environment for example thanks to technologies emitting little greenhouse gas emissions or using effectively water resources. Nonetheless, technological innovations can also create

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<sup>68</sup> Intergovernmental Panel on Climate Change, *Climate Change 2014: Impacts, Adaptation, and Vulnerability* (WHO/UNEP, 214) 239.

<sup>69</sup> *ibid* 232.

<sup>70</sup> *ibid* 232.

<sup>71</sup> *ibid* 233.



negative pressures by increasing water demand for their production for example. Most innovations generate both positive and negative impacts on the environment. Since the 1970s, the development of policies to protect and conserve the environment, as well as the pressure from growing public awareness have encouraged cleaner and more environmentally friendly technologies.<sup>72</sup> In the water sector, innovations are changing the way water is used, cleaned and reused. In recent years, developed countries or regional organizations such as the European Union have invested an increasing amount of funds to develop the research and development (R&D) in environmental fields. Industries are developing new technologies and way of production to reduce water use and wastewater discharge into the environment.<sup>73</sup>

The renewable energy sector has boomed over the last 20 years. Public and political pressures have pushed for innovations so as to reduce greenhouse gas emissions to alleviate global climate change. Three generations of renewable energy can be distinguished. The first generation is constituted of the development of hydropower and biomass combustion. The second generation has seen solar heating and wind power spread over developed countries. These innovations are now being followed by concentrated solar power, ocean energy, enhanced geothermal systems and integrated bioenergy systems. Innovation waves have enable to lower the cost of productions and to spread these technologies worldwide.<sup>74</sup>

According to the International Energy Agency (IEA), global energy demand is going to increase by 55% through 2030.<sup>75</sup> Hydroelectric power and other renewable energy resources are expected to grow by 60% in the meantime. If it can't be denied that renewable energy would still account for a small part of the energy demand, the development of renewable energy production will still have a significant impact on water resources.

Biotechnology constitutes a valuable asset in addressing water scarcity and quality issues for both developed and developing countries, particularly in the agricultural sector. In fact, the breeding of plants and animals has greatly increased

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<sup>72</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 72.

<sup>73</sup> *ibid* 72.

<sup>74</sup> *ibid* 72.

<sup>75</sup> *ibid* 41.

agricultural productivity by developing a better resistance to pests, disease and weather extremes.<sup>76</sup>

In fighting global warming, bioenergy has been developed as a renewable energy source derived from plant materials, which helps reduce carbon dioxide emissions. New bioenergy sources are developed to intensify this dynamic, such as cellulose, agricultural residues, waste products and woody biomass.<sup>77</sup>

In addition, nanotechnologies are promising for the water sector. Indeed, the fabrication and utilization of extremely small electronic circuits and mechanical devices in this sector constitute precious tools for desalinization, water purification, and wastewater treatment.<sup>78</sup>

Climate change in itself asks for technological innovations. The 2009 UN Water report states that substantial amounts of new investments will be needed over the next decades to meet the increasing energy needs of developing economies.<sup>79</sup> Investments in adaptation will be necessary to protect fragile groups and infrastructure. The relationship between water and measures mitigating climate change is correlative. Some measures alleviating climate change can be harmful for water quantity and quality, but some water policies can also produce greenhouse gas emissions. A good example of this thorny relationship is hydroelectric installations. In recent years, many developing countries have shifted from producing energy through thermal energy plants that burn fossil fuels and emit large amounts of greenhouse gas, to cleaner energy sources like hydroelectricity. Hydroelectricity is considered as a 'clean' source of energy, that helps fight climate change at the global scale. Still, significant amount of greenhouse gases are released in the process from sediment and decaying organic matter at the bottom of reservoirs.<sup>80</sup> The decomposition of organic matters in the bottom water results in the release of methane and greenhouse gas.

Another challenge carried by technological innovation is its own dissemination. Technological innovation originates mostly from developed countries, but introducing these technologies into developing countries is a key aspect of human development and will significantly help build a global sustainable development of

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<sup>76</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 41.

<sup>77</sup> *ibid* 44.

<sup>78</sup> *ibid* 45.

<sup>79</sup> *ibid* 72.

<sup>80</sup> *ibid* 72.

societies.<sup>81</sup> That being said, according to the United Nations Framework Convention on Climate Change (UNFCCC),<sup>82</sup> a great part of the technologies for mitigating climate change are already available in developing countries, such as coastal revetment.<sup>83</sup>

### *3.3.3 Policies, Laws and Finance*

At the national level, fighting climate change puts pressure on governments, who have to face increasing management and budget requirements in key sectors such as public health care, disaster risk reduction and public security. This added stress is not easy to cope with for already unstable social and political structures that have limited resources.<sup>84</sup> At the international level, growing public awareness and the UNFCCC are the main catalysts of pressure on governance systems.

Most strategies have focused on mitigation efforts, which at first sight concern energy policies, international trade and transportation. In many countries, ministries in charge of the environment are empowered to deal with climate change. But with the development of regional carbon trading markets and carbon-constrained economies, climate change policies will have to be integrated to other sectors, especially finance and planning.<sup>85</sup>

Today, few governance structures are tackling the problem of water management, and fewer emerging issues such as climate change. It can't be denied that there is little knowledge about which types of water policies work the best in which context and what they mean for water equity, efficiency and sustainability. But water-reforms and long term planning are of paramount importance to mitigate the effects of climate change and assure the availability of water resources.<sup>86</sup>

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<sup>81</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 41.

<sup>82</sup> United Nations Framework Convention on Climate Change (Nairobi 9 May 1992, in force 21 March 1994) (U.N. Doc. A/AC.237/18 (Part II)/Add.1) (UNFCCC).

<sup>83</sup> UN Water, *Water in a Changing World - The United Nations World Water Development Report 3* (UNESCO Publishing, Paris 2009) 72.

<sup>84</sup> *ibid* 73.

<sup>85</sup> *ibid* 73.

<sup>86</sup> *ibid* 73.

### 3.3.4 *The Climatic Origins of Conflicts: the Unexpected Consequences of a Drought in China*

A recent article published in the French monthly *Monde Diplomatique*, tackle the issue of conflicts in the Middle East under the prism of climate change.<sup>87</sup> The author, Agnès Sinaï, takes the next 21<sup>st</sup> United Nations Conference of the Parties (COP21) on Climate that will be held in Paris next December as an excuse to question the link between climate change, natural disasters and political instability. She underlines that even if natural accidents multiply, world leader do not seem to take the full measure of the current environmental emergency. In this article, poor harvests in China are linked to the Arab Spring, with climate change as a common denominator. If the title arouses curiosity, the thought provoking argumentation sheds light on the broader impacts of climate change on the environment and tackles the issue of the role of international environmental law in building global peace and security.

We can learn that between 2006 and 2011, Syria was subjected to the longest drought and the largest crop loss since the first civilizations of the Fertile Crescent. In total, of the twenty-two million people the country then had, nearly a million and a half were affected by desertification,<sup>88</sup> which caused massive migrations of farmers and their families to the cities.<sup>89</sup> This rural exodus fueled the tensions caused by influx of Iraqi refugees that followed the US invasion of 2003. For decades, the Baathist regime in Damascus neglected the country natural resources, subsidized wheat and cotton farming requiring large amount of water resources and encouraged inefficient irrigation techniques. Overgrazing and population growth increased the phenomenon. Freshwater resources diminished by half between 2002 and 2008.<sup>90</sup>

Furthermore, Agnes Sinaï explains that the collapse of the Syrian agricultural system results from a complex interplay of factors including climate change, poor

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<sup>87</sup> Agnès Sinaï, 'The climatic origins of conflicts: the unexpected consequences of a drought in China', original title: 'Aux origines climatiques des conflits: Les conséquences inattendues d'une sécheresse en Chine' (Le Monde Diplomatique, Paris August 2015).

<sup>88</sup> IRIN News, 'SYRIA: Drought driving farmers to the cities', (IRIN News, 2 September 2009) <<http://www.irinnews.org/report/85963/syria-drought-driving-farmers-to-the-cities>> accessed 10 August 2015.

<sup>89</sup> Gary Nabhan, 'Drought drives Middle Eastern pepper farmers out of business, threatens prized heirloom chiles', (Grist.org, 16 January 2010) <<http://grist.org/article/2010-01-15-drought-drives-middle-eastern-peppers/>> accessed 10 August 2015.

<sup>90</sup> Agnès Sinaï, 'The climatic origins of conflicts: the unexpected consequences of a drought in China', original title: 'Aux origines climatiques des conflits: Les conséquences inattendues d'une sécheresse en Chine' (Le Monde Diplomatique, Paris August 2015).

management of natural resources and demographic drivers.<sup>91</sup> According to Francesco Femia and Caitlin Werrell from the Center for Climate and Security this "combination of economic, social, environmental and climate change has eroded the social contract between citizens and government, catalyzed opposition movements and irreversibly degraded legitimacy of Assad's power".<sup>92</sup> According to them, the emergence of the Organization of the Islamic state and its expansion in Syria and Iraq are partly the result of drought. And it does not come only from natural climate variability. This journal of the American Academy of Sciences presents it as an anomaly: "The change in rainfall in Syria is linked to the average rise in sea level in the eastern Mediterranean, combined with the fall of the soil moisture. No natural cause does appear in these trends, while drought and warming corroborate response models to rising greenhouse gases".<sup>93</sup>

Further, it can be read that in eastern China, during the winter of 2010-2011, the lack of rainfall and sandstorms led the government of Mr. Wen Jiabao to launch rockets in order to trigger rainfall, which had impacts far beyond the country's borders. Crop loss has indeed forced Beijing to buy wheat on the international market. Soaring world prices that followed fueled popular discontent in Egypt, the world's largest wheat importer, where households currently spend more than a third of their resources on food.<sup>94</sup> The price of a tone of wheat rose from \$ 157 in June 2010 to 326 dollars in February 2011, and had serious financial impact in this very import-dependent country. The price of bread tripled, which increased popular discontent against the authoritarian rule of President Hosni Mubarak.<sup>95</sup>

As Sinaï underlines, in the same period, crops of wheat, soybeans and corn from the southern hemisphere were affected by what has been called "La Niña", a severe weather event that caused a drought in Argentina and torrential rains in

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<sup>91</sup> Agnès Sinaï, 'The climatic origins of conflicts: the unexpected consequences of a drought in China', original title: 'Aux origines climatiques des conflits: Les conséquences inattendues d'une sécheresse en Chine' (Le Monde Diplomatique, Paris August 2015).

<sup>92</sup> Francesco Femia and Caitlin Werrell, 'The Arab Spring and climate change' (The Center for Climate and Security, Washington, DC, February 2013), <<https://www.americanprogress.org/issues/security/report/2013/02/28/54579/the-arab-spring-and-climate-change/>> accessed 10 August 2015.

<sup>93</sup> Proceedings of the National Academy of Sciences of the United States of America (American Academy of Sciences, vol. 112, n° 11, Washington DC, 17 mars 2015).

<sup>94</sup> Agnès Sinaï, 'The climatic origins of conflicts: the unexpected consequences of a drought in China', original title: 'Aux origines climatiques des conflits: Les conséquences inattendues d'une sécheresse en Chine' (Le Monde Diplomatique, Paris August 2015).

<sup>95</sup> *ibid.*

Australia. In an article in the journal *Nature*, Solomon Hsiang, Kyle Meng and Mark Cane correlate civil wars and El Niño Southern Oscillation (ENSO), which every three to seven years, causes an accumulation of warm water along the coasts of Ecuador and Peru, as well as a reversal of the trade winds of the Pacific, associated with important weather patterns worldwide.<sup>96</sup> For Hsiang and colleagues, the likelihood of civil conflict doubles during ENSO. This is the first demonstration that the stability of modern societies depends heavily on the global climate.

Sinai highlights that climate change has become a “snowball threat” and alters the course of international relations.<sup>97</sup> After the *hard security* inherited from the Cold War follows the *natural security*, which is a concept created by the US military from the Center for a New American Security.<sup>98</sup> This think tank was established in 2007 to counter climate-skepticism of neoconservatives and identify emerging global threats.

Moreover, as far as the Arctic is concerned, ice could be completely melted by the end of the century, and the effects of global warming are twice as more intense there than elsewhere, and claims of new land and sea borders revives the tensions between circumpolar countries.<sup>99</sup> Russia, which has explored the Arctic for centuries, is the only nation to possess a nuclear icebreaker fleet, a giant model is under construction in the shipyards of St Petersburg and will be completed by 2017.<sup>100</sup> On the American side, the opening of the Arctic is seen both as a commercial opportunity vis-à-vis Asia and as a chance to secure new energy resources.<sup>101</sup> But, the melting of the Arctic has systemic effects. Indeed, the variation of the polar vortex, which is a large pocket of very cold air from the North Pole,<sup>102</sup> explains the intense cold that descended on North America during the winter 2013-2014. Jean-Michel Valantin, a military strategy expert, observes that “the interaction between the Arctic and global

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<sup>96</sup> Solomon M. Hsiang, Kyle C. Meng and Mark A. Cane, ‘Civil conflicts are associated with the global climate’ (*Nature*, vol. 476, n° 7361, London, 25 August 2011).

<sup>97</sup> Agnès Sinai, ‘The climatic origins of conflicts: the unexpected consequences of a drought in China’, original title: ‘Aux origines climatiques des conflits: Les conséquences inattendues d’une sécheresse en Chine’ (*Le Monde Diplomatique*, Paris August 2015).

<sup>98</sup> *ibid.*

<sup>99</sup> See Gilles Lapouge, ‘Fascination pour les pôles’ (*Le Monde diplomatique*, December 2010) <<http://www.monde-diplomatique.fr/2010/12/LAPOUGE/19929>> accessed 10 August 2015.

<sup>100</sup> Russia Today, ‘Russia lays down world’s largest icebreaker’ (Russia Today, 5 November 2013) <<http://www.rt.com/news/world-biggest-icebreaker-russia-275/>> accessed 10 August 2015.

<sup>101</sup> White House, ‘National strategy for the Arctic region’ (White House, Washington DC, 10 May 2013) <[https://www.whitehouse.gov/sites/default/files/docs/nat\\_arctic\\_strategy.pdf](https://www.whitehouse.gov/sites/default/files/docs/nat_arctic_strategy.pdf)> accessed 10 August 2015.

<sup>102</sup> Cornell University, *What is a polar vortex?* (Climate Change, 2015) <<http://climatechange.cornell.edu/what-is-a-polar-vortex/>> accessed 10 August 2015.

warming is something new in human strategic history, because it turns the meeting of geography and geophysics in this region into a new, strange power of geophysical nature, which we shall name here the “Arctic environmental power”, which exercises itself on a planetary scale, with massive consequences.”<sup>103</sup>

However, the last report of the Intergovernmental Panel on Climate Change (IPCC) states that there is no settled theory that suggests the occurrence of armed conflict in the North Pole. Melting ice will reveal the robustness of circumpolar border cooperation institutions, such as the Arctic Council. The causalities are complex, unstable and evolving; the effects of global warming weigh more or less on societies depending on the resilience of political, economic and social systems in place.<sup>104</sup>

The sources of environmental insecurity can not be reduced to purely exogenous and natural forces such as volcanic eruptions, tsunamis or earthquakes. Human activities, accelerating production cycles and globalization contribute to destabilizing the climate. The neologism "Anthropocene" refers to the enormous footprint of industrial societies on the evolution of the Earth system.

Climate change not only creates additional grounds for violent conflict, but also new forms of war, underlines the psychologist Harald Welzer.<sup>105</sup> The extreme violence of these conflicts goes beyond the scope of conventional theories and “establishes situations for which no reference framework is provided”. The chaos in Darfur, Sudan, which continues since 1987, is emblematic of this self-destructive dynamic exacerbated by state fragility. In northern Nigeria, land degradation has affected agricultural and pastoral livelihoods and interferes with migratory routes. Hundreds of villages have been abandoned and migration contributed to destabilize the region, making the bed of the Islamist movement Boko Haram.

The last IPCC report defines the concept of “compound risk”, which refers to the convergence of multiple impacts in a given geographical area: “Because the average global temperature is likely to increase by 2 to 4°C by 2050 in comparison

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<sup>103</sup> Jean-Michel Valantin, ‘The warming Arctic, a hyper strategic analysis’ (The Red (Team) Analysis Society, 20 January 2014) <<https://www.redanalysis.org/2014/01/20/the-warming-arctic-a-hyper-strategic-crisis/>> accessed 10 August 2015.

<sup>104</sup> Intergovernmental Panel on Climate Change, *Climate Change 2014 : Impacts, Adaptation, and Vulnerability* (2 vol., Cambridge University Press, Cambridge 2014).

<sup>105</sup> Harald Welzer, *Les Guerres du climat. Pourquoi on tue au XXIe siècle* (English translation: Climate Wars. Why do we still kill in the XXIst century) (Gallimard, coll. NRF essais, Paris 2009).

with the temperatures in 2000, there is a potential, for major changes in the schemes of interpersonal violence, group conflict and social instability in the future.”<sup>106</sup> The researcher Marshall B. Burke, of the University of California, Berkeley, and his co-authors anticipate growth of armed conflict by 54 % by 2030. The study provides the first comprehensive assessment of potential impacts of climate change on the wars taking place in Sub-Saharan Africa. It highlights the link between civil war, rising temperatures and reduced rainfall, by extrapolating the IPCC median projections of emissions of greenhouse gas for these regions between 2020 and 2039.<sup>107</sup>

Lastly, the influx of refugees at the gates of Europe could continue and even increase over the next century. “There are now at least as many displaced people worldwide because of environmental degradation, as people displaced by war and violence” says the political scientist Francis Gemenne.<sup>108</sup> Immigrants are fleeing wars happening far away from the Occident. Which, despite of its historical responsibility in global warming, is reluctant to give them a status: “Refuting the term of "climate refugee" amounts to refute the idea that climate change is a form of persecution against the vulnerable”.<sup>109</sup> Those are the victims of a process of transformation of the Earth that is beyond them.

It is clear from the above that climate change can have tremendous impacts on life, human beings and the environment. Droughts in one part of the world can significantly affect the life of people on another continent. The current political instability around the world is a result of a complex interplay of factors, but climate change is one of them. Indeed, the regulation of the development and use of water resources by international law can help preserve the environment, but also ameliorate the life of millions, as well as limiting political instability in some regions. Accordingly, we can reasonably conclude that international law through the prism of water helps building global peace and security.

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<sup>106</sup> Intergovernmental Panel on Climate Change, *Climate Change 2014 : Impacts, Adaptation, and Vulnerability* (2 vol., Cambridge University Press, Cambridge 2014).

<sup>107</sup> Marshall B. Burke, Edward Miguel, Shanker Satyanath, John A. Dykema et David B. Lobell, ‘Warming increases the risk of civil war in Africa’ (*PNAS*, vol. 106, n° 49, 23 November 2009) <<http://www.pnas.org/lens/pnas/106/49/20670>> accessed 10 August 2015.

<sup>108</sup> Naomi Klein, Susan George and Desmond Tutu, *Stop crime climatique. L'appel de la société civile pour sortir de l'âge des fossiles* (English translation: Stop the Climatic Crime. A call from the Civil Society do get out of Middle Age) (Seuil, coll. Anthropocène , 27 August 2015).

<sup>109</sup> *ibid.*



### **Part III. International Watercourses. Environmental Protection and Sustainable Use**

#### **4. The International Legal Environment Relating to Water**

Global and regional treaties, as well as non-binding instruments from international organizations such as UNECE,<sup>110</sup> UNEP,<sup>111</sup> OECD,<sup>112</sup> or the ILA<sup>113</sup> constitute a fledged body of rules that aims at preventing pollution of freshwater resources. In 1997, the United Nations, through the draft articles of the ILC, developed a global framework convention for a global protection of freshwater resources: the Convention on the Law of Non-Navigational Uses of International Watercourses.<sup>114</sup> This convention is recognized to codify customary law relating to water.

Fifty per cent of the world's river basins are shared by two or more states and provide the majority of the supply used by human activity.<sup>115</sup> Thus, geographical and political reasons constitute major factors in the making of international agreements relating to water.

##### **4.1 The Legal Environment. Treaty Law, Customs and Case Law**

The bulk of international environmental law relating to water is made up of independent agreements and *ad hoc* responses to particular disputes over rivers, lakes and freshwater ecosystems. Treaty law mostly, decisions of the International Court of Justice (ICJ) and international arbitral tribunals, work of the ILC and of the ILA, are reflecting state practice on the matter.<sup>116</sup> Allocation of shared water resources and water pollution are the most frequent issues addressed by these instruments in the context of water management. Nevertheless, as Sands points out, it was claimed in the mid-1980s that “there [were] no rules of global application and, in particular, [...] no

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<sup>110</sup> United Nations Economic Commission for Europe.

<sup>111</sup> United Nations Environment Program.

<sup>112</sup> Organisation for Economic Co-Operation and Development.

<sup>113</sup> International Law Association.

<sup>114</sup> United Nations Convention on the Law of Non-Navigational Uses of International Watercourses (New York, 21 May 1997, in force 17 August 2014) UNTS I-52106 (hereinafter: UN Watercourses Convention or UNWC).

<sup>115</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 304.

<sup>116</sup> *ibid* 305.

rule of customary international law prohibiting pollution of international rivers”.<sup>117</sup> At the time, this view held some truth but the international legal framework today would not allow such an assertion. General principles and rules of international environmental law have been developed especially to mitigate as far as possible the detrimental effects of certain human activities on the environment including water resources. The main principles of international environmental law that are to be applied on the water sector include: the principle of preventive action,<sup>118</sup> the precautionary principle,<sup>119</sup> the polluter pays principle,<sup>120</sup> the principle of sovereignty over natural resources and the no harm principle,<sup>121</sup> the principle of common but differentiated responsibility,<sup>122</sup> and procedural requirements like environmental impact assessment or the duty to cooperate.<sup>123</sup> In addition, Principle 21 of the Stockholm Declaration<sup>124</sup> presents the principle of “sovereignty over natural resources and the responsibility not to cause damage to the environment of other states or to areas beyond national jurisdiction”, later repeated in principle 2 of the Rio Declaration.<sup>125</sup> In addition, procedural requirements associated with the duty to cooperate, as well as environment impact assessment, have become essential parts of customary law relating to the protection of freshwaters.<sup>126</sup>

In 1929 in the River Oder case,<sup>127</sup> the Permanent Court of International Justice (the PCIJ is the predecessor of the ICJ) declared that the use of international watercourses was subject to international law and that the “community of interests in a navigable river [which] becomes the basis of a common legal right, the essential

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<sup>117</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 305. Referring to: J. Sette-Camara, ‘Pollution of International Rivers’, (186 *Receuil des Cours*, 1984) 198.

<sup>118</sup> Endorsed directly or indirectly by Principles 6, 7, 15, 18 and 24 of the Stockholm Declaration ; and Principle 1 of the 1978 UNEP Draft Principles.

<sup>119</sup> Principle 15 of the Rio Declaration.

<sup>120</sup> Principle 7 of the Rio Declaration.

<sup>121</sup> Principle 21 of the Stockholm Declaration and Principle 2 of the Rio Declaration.

<sup>122</sup> Principle 7 of the Rio Declaration, Article 3(1) of the 1992 Climate Change Convention.

<sup>123</sup> Principle 27 of the Rio Declaration, Principle 24 of the Stockholm Declaration, 1982 World Charter for Nature.

<sup>124</sup> United Nations, ‘Report of the United Nations Conference on the Human Environment’ (Stockholm, 5-16 June 1972) (A/CONF.48/14/Rev.1) (hereinafter Stockholm Declaration).

<sup>125</sup> United Nations, ‘Report of the United Nations Conference on Environment and Development’ (Rio de Janeiro, 3-14 June 1992) (A/CONF.151/26 (Vol. I)) (hereinafter Rio Declaration).

<sup>126</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 305

<sup>127</sup> *Case Concerning the Territorial Jurisdiction of the International Commission of the River Oder*, [1929] PCIJ Judgment No. 16, Ser. A No. 23, 27.

features of which are the perfect equality of all riparian states in the use of the whole course of the river and the exclusion of any preferential privilege of any one riparian [in relation to] the others”.<sup>128</sup> Nearly 70 years later, the ICJ developed further the concept of ‘community of interests’ relating to international watercourses. Not only co-riparian states were equally entitled to access and use shared watercourses, but the ICJ considered that non-navigational uses of shared watercourses, including the protection of the water and prevention from pollution, were concerning each and every co-riparian states and, that they should cooperate to attain these objectives. Indeed, the evolution of international law in the last decades increasingly supervised non-navigational uses of international rivers, as the 1997 Watercourses Convention reflects. This principle has been greatly welcomed by states and well implemented. This approach of a ‘common legal right’ over rivers, lakes or groundwater, prevent states from using shared water resources in a way that limit the capacity of other riparian states to do so. Hence, it appears to be for the own good of all riparian states. On top of that, if pollution is not completely prohibited by international law, international customary law addresses this matter to the extent that the quality of freshwater should not be affected to the level where it cannot be used any more, or that its potential for use is materially diminished.<sup>129</sup>

Today, state practice reflects this approach and most states do not consider their right of use to be unlimited. Under international law, states are compelled to negotiate, consult and co-operate to reach an equitable solution to the issues related to activities affecting the use of shared water resources, including water pollution and excessive use.<sup>130</sup> As early as 1923, treaty law already evidenced this approach, for example the Convention Relative to the Development of Hydraulic Power Affecting More Than One State.<sup>131</sup>

The increasing number of judicial decisions relating to water management reflects the rapidly evolving characteristic of international law. Progressively, some

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<sup>128</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 305. Referring to the *Case Concerning the Territorial Jurisdiction of the International Commission of the River Oder*, [1929] PCIJ Judgment No. 16, Ser. A No. 23, 27.

<sup>129</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 306.

<sup>130</sup> *Ibid* 306.

<sup>131</sup> Convention Relative to the Development of Hydraulic Power Affecting More Than One State (36 LNTS 76) (Geneva 9 December 1923).

principles are better ascertained and reflected in judicial decisions. For instance, in the Pulp Mills case,<sup>132</sup> the ICJ confirmed that the conduct of an environmental impact assessment was compulsory where there was the risk that the activity at stake could significantly harm shared water resource.<sup>133</sup> The growing use of EIA has a great impact on the environment as a whole, and prevents industrial actors to build facilities detrimental to the environment. However, the substance of this obligation was not further detailed by the ICJ, which considerably weakens its effects. Furthermore, the ICJ specified that states were allowed to take regulatory measures to protect the shared water resource even though it would restrict the rights of other riparian states, in the extent that such measures were limited.<sup>134</sup>

#### 4.1.1 Lac Lanoux Arbitration

The concept of ‘community of interest’ developed by the PCIJ in 1929 was mirrored in the landmark Lac Lanoux case between France and Spain in 1957.<sup>135</sup> The arbitral tribunal had to ascertain if France had infringed Spain’s rights under treaty law by authorizing the construction of a barrage to channel water to an hydro-electric power plant, which would divert around 25% of the Carol River flow before returning into the river, and would be used later on by Spanish farmers.<sup>136</sup> Spain pleaded that the channeling of water by France was against its interests, even though the water was diverted back to the river. From this situation, Spain considered that the return of water into the river was entirely dependent on the French will, which made France a preponderant actor in water management. This preponderance was seen by Spain as going against the equality of the parties, status quo that had been previously agreed through bilateral treaties.<sup>137</sup> The arbitral tribunal examined if riparian states, prior to

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<sup>132</sup> *Case concerning Pulp Mills on the River Uruguay (Argentina v Uruguay)* [20 April 2010] International Court of Justice.

<sup>133</sup> *ibid* para. 204-205.

<sup>134</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 306.

<sup>135</sup> Since the original document issued by the arbitral tribunal could not be obtained Philippe Sands’ understanding was used in this section. See: Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 307. Referring to *Lac Lanoux Arbitration (France v Spain)* [16 November 1957] Arbitral Tribunal R.I.A.A. 281; 24 I.L.R.

<sup>136</sup> *Lac Lanoux Arbitration (France v Spain)* [16 November 1957] Arbitral Tribunal R.I.A.A. 281; 24 I.L.R.

<sup>137</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 41. Referring to the three treaties at Bayonne on 1 December 1856, 14 April 14 1862, 26 May 26 1866.

engaging in activities that could harm a shared river resource, were subjected to the obligation of common consultation and notification. The tribunal found that even though France was entitled to exercise its rights, Spanish interests could not be left aside and that Spain was entitled to claim for its rights to be respected and its interests taken into consideration. From that statement alone, one could have drawn the conclusion that taking into consideration the interests of other riparian states was one of the requirements established by customary international law, understood as the notion of “community of interest” mentioned above. But further, the arbitral tribunal specified that it did not mean for France to be compelled to seek an agreement prior constructing works on shared river resources, because it would actually give to Spain a right to veto that would freeze the exercise of territorial competence of one State at the discretion of another.<sup>138</sup> Accordingly, the arbitral tribunal held that it did not constitute an infringement. But, it suggested that if Spain had succeeded in demonstrating that the water diverted back into the water flow was polluted, presented an altered chemical composition, a changed temperature, other characteristics that would injure Spain’s interests, their claim would have been considerably stronger.<sup>139</sup>

As a result, this judgment established, in international environmental law, the principle of prior consultation with another state before undertaking a project that has transboundary effects. In the aftermath, the principle was repeated by a number of international instruments, such as the Environmental Impact Assessment Convention.<sup>140</sup> This case also tackled the question of the equity among riparian states. To this matter, the tribunal gave further ground to the sovereignty over natural resources and ensured rights of upstream states. As Sands highlights, this judgment outlined the limits imposed on states using shared water resources and presented the procedural obligations attached to environmental protection, it also testifies the limited state of international environmental customary law in 1957.<sup>141</sup>

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<sup>138</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 42. Referring to *Lac Lanoux Arbitration* (France v Spain), [16 November 1957], 12 UN Reports of International Arbitral Awards 281 (1957).

<sup>139</sup> *Lac Lanoux Arbitration* (France v Spain) [16 November 1957] Arbitral Tribunal R.I.A.A. 281; 24 I.L.R.

<sup>140</sup> United Nations, ‘Convention on environmental impact assessment in a transboundary context’, (Espoo Finland 25 February 1991, in force 10 September 1997) (C104, 24/04/1992, p. 7) (hereinafter Espoo Convention).

<sup>141</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 308.

#### 4.1.2 ILA. 1966 Helsinki Rules and Beyond

The protection and management of freshwater resources took a new turn in 1966 with the adoption of ILA's non-binding Helsinki Rules on the Uses of the Waters of International Rivers.<sup>142</sup> The Helsinki Rules were the results of a long work by international lawyers to clarify the international legal framework applying to the uses of international watercourses.<sup>143</sup> They aimed at identifying precisely the rights and obligations of states.

Article I provides that this set of rules governs water use of "international drainage basin" to the extent that it is in accordance with applicable treaty or custom. The notion of "international drainage basin" is defined in Article II of the document as "a geographical area extending over two or more States determined by the watershed limits of the system of water, including surface and underground water resources, flowing into a common terminus". Article III adds that every state sharing a water basin holds the right to 'a reasonable and equitable share in the beneficial use' of the water. But, Article IV specifies that this entitlement is subject to the relevant factors in local situations. The Helsinki Rules also deal with water pollution. Article IX defines water pollution as "any detrimental change resulting from human conduct in the natural composition, content, or quality" of water. At the time, this definition constituted the most detailed legal description of water pollution.<sup>144</sup> Article X(1) puts three obligations upon states: to prevent new forms of water pollution or an increase of existing pollution that would cause "substantial injury" in the territory of other basin states and, to take "all reasonable measures" to lessen existing pollution. As Article XI provides, states that are in violation of these obligations are to be held responsible for the injuries caused and have to enter into negotiations to reach with the injured party an equitable settlement. The approach developed in the Helsinki

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<sup>142</sup> *Helsinki Rules on the Uses of the Waters of International Rivers* (20 August 1966), Fifty-Second Report of the International Law Association (484 ; 2 IPE 5741) (1967).

<sup>143</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 308.

<sup>144</sup> *ibid* 308.

Rules was also to be found in the work of the Institut de Droit International<sup>145</sup> regarding water pollution.<sup>146</sup>

In 1982 and 1986, the ILA adopted further non-binding rules concerning water pollution and groundwater resources, respectively the Rules on Water Pollution in an International Drainage Basin,<sup>147</sup> and the Rules on International Groundwater.<sup>148</sup> The set of rules relating to groundwater resources urged states to prevent or act for the abatement of pollution of international groundwater “in accordance with international law applicable to existing, new, increased and highly dangerous pollution”.<sup>149</sup> According to Article 1, the notion of international groundwater is to be understood as “waters of an aquifer that is intersected by the boundary between two or more [basin] states”.

However, the Helsinki Rules were recently updated and replaced by the Berlin Rules on Water Resources, adopted by the ILA in 2004.<sup>150</sup> This new set of rules is composed of fourteen chapters. Article I defines the aim of these new rules as to “express international law applicable to the management of the water of international drainage basins and applicable to all water, as appropriate”. Various principles relating to water management are presented in Chapter II, among them: principles on participation, conjunctive management, integrated management and sustainability. Article IX emphasizes that states “shall take all appropriate measures to prevent or minimize environmental harm”, confirming the notion developed in 1966. Article XVI points out that states are under the obligation to “refrain from and prevent acts or omissions within their territory that cause significant harm to another basin State having due regard for the right of each basin State to make equitable and reasonable use of the waters”. Article XVI further develops the no-harm principle that was present in Article X(1) of the 1966 Rules, by including inaction as a fault and a source of liability for basin States. Chapter IV encapsulates emerging topics such as access to

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<sup>145</sup> ‘Resolution on Pollution of Rivers and Lakes and International Law’, (*Annuaire de l’Institut de Droit International*, 58-1) (Athens 1979) 193.

<sup>146</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 308.

<sup>147</sup> ‘Rules on Water Pollution in an International Drainage Basin’ (Montreal 4 September 1982), (Sixtieth Report of the International Law Association 1983) 535.

<sup>148</sup> ‘Rules on International Groundwaters’ (Seoul, 30 August 1986), (62 ILA 251, 1987).

<sup>149</sup> *ibid* article 3(1).

<sup>150</sup> ‘Berlin Rules on Water Resources’ (Seventy-First Report of the International Law Association, 2004) 344.

water, public participation – that was developed by the 1998 Aarhus Convention<sup>151</sup> –, and protection of particular communities. The protection of the aquatic environment is put forward in Chapter V. This chapter develops various notions such ecological integrity and the precautionary approach, prevention of the introduction of hazardous substances and pollution, and the establishment of water quality standards.<sup>152</sup> The procedural requirement of environmental impact assessment is detailed in Chapter VI. It can be noticed that this body of rules consecrates a whole chapter for the protection of groundwater resources (Chapter VIII). Chapter XI provides for the general rules on international co-operation: exchange of information, notification and consultation. Article LXII considers the harmonization of national rules in the water management field. State responsibility is tackled in Chapter XII, legal remedies in Chapter XIII, and the settlement of international disputes is presented in Chapter XIV.<sup>153</sup>

Parallel to the ILA work, international organizations such as the UN,<sup>154</sup> UNEP,<sup>155</sup> the OECD,<sup>156</sup> and the UNECE have adopted non-binding guidelines and recommendations. In addition, several conventions and the EU Water Framework Directive have sought to complement the picture.<sup>157</sup>

#### 4.1.3 ILC 1997 Watercourses Convention

The previous treaties and arbitrations provided the legal background for the negotiation and adoption of the 1997 Watercourses Convention. The ILC draft Articles on the Law of Non-Navigational Uses of International Watercourses were used as the base for negotiation of the final Convention. The 1997 Watercourses

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<sup>151</sup> The United Nations Economic Commission for Europe Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus, Denmark 25 June 1998, in force 30 October 2001) (Registration on 30 October 2001, No. 37770) (2161 UNTS 447; 38 ILM 517, 1999).

<sup>152</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 309.

<sup>153</sup> *ibid* 309.

<sup>154</sup> UN-Water Conference, *Recommendation on Environment and Health* (Mar del Plata, 25 March 1977) (26 IPE 166, E/CONF.70/29).

<sup>155</sup> UNEP, *Environmental Guidelines for Watershed Development* (UNEP EMG #3, 1982).

<sup>156</sup> OECD Council Recommendation, *Control of Eutrophication of Waters* (14 November 1974) (OECD C(74)220) ; OECD Council Recommendation, *Strategies for Specific Water Pollutants Control* (14 November 1974) (OECD C(74)221); OECD Council Recommendation, *Water Management Policies and Instruments* (5 April 1978) (OECD C(78)4).

<sup>157</sup> Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (EU Water Framework Directive) (in force 22 December 2000, amended since then) (OJ L 327, 22 December 2000).



Convention applies and governs the uses of international watercourses, excluding navigation. Besides, the Convention pushes for the cooperation among watercourse states through watercourse agreements. This new set of rules constitutes a framework of general principles to guide states' policies. The ICJ when investigating the Gabčíkovo-Nagymaros Project developed a similar approach.<sup>158</sup> This parallelism can be understood as an approval from the court toward this new body of international rules.

The Convention is the principal international legal instrument available today for the protection of water resources at the global scale. In order to determine the adequacy and efficiency of the international legal framework, it is essential to conduct a first analysis of the convention.

The Convention consists of five operational parts. It begins with Part II, composed of general principles, Part III provides the rules relating to planned measures, Part IV holds articles related to the protection, preservation and management of international watercourses, Part V relates to harmful conditions and emergency situations, finally Part VI contains miscellaneous provisions.<sup>159</sup>

Article 3 provides states some flexibility in the implementation of the Convention. Indeed, paragraphs 1 and 3 respectively state that the Convention does not modify rights and obligations arising from previous engagement and that when entering into new agreements states can “apply and adjust” the provisions of the Convention so as to develop rules tailored to particular international watercourse.<sup>160</sup> The principle of equitable and reasonable use of natural resources is encapsulated in Article 5. This article is of paramount importance, as it requires watercourse states to use the resource in an optimal and sustainable manner. In addition, Article 7 stipulates that watercourse states must “take all appropriate measures to prevent the causing of significant harm to other watercourse States”. In this respect, Article 21 of the Convention provides for the obligation upon states to prevent pollution. These general principles play a significant role in assuring that states follow rules that aims at better protect and manage shared water resources. Nonetheless, it can be noted that the

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<sup>158</sup> *Case Concerning the Gabčíkovo-Nagymaros Project* [1997] ICJ (ICJ Reports 7) para. 78.

<sup>159</sup> UN Watercourses Convention.

<sup>160</sup> *ibid* Article 3, para. 1 and 3.

content of these articles is quite brief and that more details would significantly increase their efficiency.

As far as watercourse states cooperation is concerned, Article 8 provides for a general obligation to cooperate. Paragraph 1 emphasizes that cooperation on the basis of sovereign equality and territorial equality is necessary to achieve optimal and sustainable utilization of international watercourses.<sup>161</sup> If this clarification is of logical sequence, it could be objected that nowadays sovereign equality cannot be taken for granted on the international scene and that great economic powers still governs international relations despite the increasing space developing economies are taking on the international scene. Furthermore, Article 9 requires a regular exchange of data and information among watercourse states. This article shows the impetus of this Convention to encourage states to work together to attain a better management and an increased level of protection of international watercourses. Part III of the Convention deals with planned measures. This part details procedural rules consisting of information exchange, a notification mechanism in case such measures have adverse effects, a delay of six month to reply to the notification in which the notifying state is forbidden to implement the measures without the ascent of the other state.<sup>162</sup> It seems that in this scenario the interests of the notified watercourse states are to be taken into consideration and that the measures at stake empower them to make them respected. Although, state practice show less consideration for the interests of co-riparian states than this provision suggests.

Part IV is dedicated to the protection and preservation of ecosystems and, the prevention, reduction and control of pollution. Article 20 puts the obligation upon watercourse states to protect and preserve, jointly or individually, ecosystems.<sup>163</sup> The fact that watercourses are dealt with as ecosystems is to be welcomed. The majority of agreements dealing with water management are sectorial and do not develop a comprehensive approach to manage the resource. The more integrated water policies are, the better managed the water resources are. Article 21 states that pollution that may causes “significant harm” is to be prevented, reduced and controlled.<sup>164</sup> Among others measures to attain this goal, states should cooperate by establishing jointly lists

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<sup>161</sup> UN Watercourses Convention Article 8.

<sup>162</sup> *ibid* Part III.

<sup>163</sup> *ibid* Article 20.

<sup>164</sup> *ibid* Article 21.

of prohibited substances. Article 22 prohibits the introduction of alien species that could have a detrimental effect on the ecosystem of the shared watercourse.<sup>165</sup> Article 23 puts forward that watercourse states are to take “all measures [...] necessary to protect and preserve the marine environment [...] taking into account generally accepted international rules and standards”.<sup>166</sup> Article 24 compels states to enter into consultations regarding the management of the shared watercourses when one of the watercourse states requests it. In that respect, the Convention suggests the creation of a joint management mechanism to facilitate procedures. It can be noticed that co-operation among watercourse states constitutes the spirit of this Convention, which raises dialogue at the same level of importance as technical measures.

Part VI provides rules on dispute settlement, which calls parties to seek settlement first by way of negotiation, mediation, conciliation or the submission of the dispute to arbitration; or to the ICJ, on the basis of a common consent. According to Article 33, if the dispute is not settled within six months after the initial request of negotiations, it can be submitted by one of the parties to an “impartial fact-finding commission”. The parties are under the obligation to cooperate with the commission, which goal is to achieve “an equitable solution of the dispute”.<sup>167</sup>

The 1997 Watercourses Convention constitutes a landmark development of international law relating to the protection and management of shared international watercourses. One of the most striking features of this instrument is that by gathering general principles of international law, it sets rules at the global level. As Sands highlights, the Convention provides minimum international standards for states and give them a basis to further develop local agreements with their watercourses neighbors to better implement the Convention and thus manage more efficiently their supplies of water.<sup>168</sup> However, one must bear in mind that local circumstances make the implementation of theoretical principles delicate. Furthermore, economic considerations and political agenda sometimes constitute great obstacles in dispute resolutions process. The management of shared international watercourses is more difficult and delicate in practice than in theory. Balancing the principles of equitable

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<sup>165</sup> UN Watercourses Convention Article 22.

<sup>166</sup> *ibid* Article 23.

<sup>167</sup> *ibid* Part IV.

<sup>168</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 312.

utilization and the obligation not to cause significant harm will be necessarily settled through case law. Nonetheless, the spirit of cooperation that transcends the text testifies of the evolving shape of international rules that guide states behavior in relation to natural resources.

#### *4.1.4 ILC 2008 Articles on Transboundary Aquifers*

Almost ten years after the adoption of the 1997 Watercourses Convention, the ILC adopted in 2008 its draft Articles on the Law of Transboundary Aquifers.<sup>169</sup> Both reflect the same spirit of cooperation and their body of rules is quite similar. Indeed, after having ascertained states sovereignty over their natural resources (Article 3), the ILC Articles on Transboundary Aquifers put forward the principles of equitable and reasonable utilization of transboundary aquifers (Article 4) and the obligation not to cause significant harm to other aquifer States (Article 6). Later, the Articles provide for the obligation upon aquifer States to cooperate (Article 7), exchange information (Article 8) and, encourage the development of local agreements (Article 9). Part III keeps on showing similarities with the 1997 Watercourses Convention by dealing with the protection, preservation and management of aquifers, including the protection of ecosystems (Article 10). Article 12 deals with the prevention, reduction and control of pollution. However, it has to be noted that this set of Articles does not comprise any provision on dispute settlement.

If the 1997 Watercourses Convention is considered as a comprehensive and particularly innovative legal instrument in the water sector, the 2008 ILC draft Articles enable to extend these improvements to groundwater resources, which would be of paramount importance for a better management of water resources at the global scale. Both an increased level of protection for groundwater resources and an improved system of cooperation for aquifer States have to be recognized in favour of this new body of rules.

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<sup>169</sup> International Law Commission, 'Draft Articles on the Law of Transboundary Aquifers' (A/63/10) (2008).

#### *4.1.5 Examples of Regional Rules*

As the this thesis intends to analyze global standards of environmental protection set by international law, it is of some relevance to mention few regional instruments that complement or further implement obligations of general and global application. Furthermore, regional rules establish binding obligations for states and in this respect reflect the state of customary law relating to water management. In addition, the quality of regional legal instruments helps evaluate the efficiency of global international legal standards.

First and foremost, the European Union has been active in the water sector, adopting rules establishing obligations upon states in various fields, including rules on groundwater resources, the quality of drinking water and, bathing water. One of the first landmark instruments was adopted within the framework of the United Nations Economic Commission for Europe (UNECE) and concerned principally water pollution having transboundary impacts. Namely, the 1992 Watercourses Convention<sup>170</sup> put obligations upon states to alleviate, control and reduce the transboundary impacts of polluting activities.<sup>171</sup> The Convention puts forward various principles of customary international law, such as the control of the pollution at the source, the precautionary and the polluter pays principles.<sup>172</sup> Furthermore, this instrument supports the use of the best environmental practice and the best available technology, respectively in Annex II and I. The Convention includes provisions in its Article 3 that indicate the use of environmental impact assessment, the reduction of inputs from industrial sources and, encourage the use of non-waste technologies. As for the procedural requirements, the Convention includes provisions for the exchange of information between riparian states (Art. 13), for states to adopt rules on responsibility and liability (Art. 7), and greatly encourages the development of joint monitoring bodies among riparian states to better manage shared watercourses (Art. 9(1) (2)). It can be noted that this last provision is similar to the one developed in the 1997 Watercourses Convention. Besides, in 1999, the parties to the 1992 Watercourses Convention adopted a Protocol on Water and Health that has the particularity to be the first international agreements that tackles directly the issue of

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<sup>170</sup> Convention on the Protection and Use of Transboundary Watercourses and International Lakes, (17 March 1992) (31 ILM 1312) (hereinafter 1992 Watercourses Convention).

<sup>171</sup> *ibid* Art. 2(1) (2).

<sup>172</sup> *ibid* Art. 2(3), Art. 2(5) (a) (b).

the quality of drinking water.<sup>173</sup> The parties to the protocol are under the obligation to set targets and deadlines to achieve access to drinking water and adequate sanitation (Article 1).

In addition, only a couple of years after the 1997 Watercourses Convention, the EU adopted a comprehensive and innovative directive establishing a framework for community action in the field of water policy, the 2000 Water Framework Directive, to complement a fragmented water policy.<sup>174</sup> Furthermore, as Sands points out, the 2000 Water Framework Directive on water policies is complemented by more than forty bilateral treaties protecting the quality and managing the use of water supplies.<sup>175</sup> The main feature of this Directive is that it constitutes one of the first attempts to establish integrated management policies on a regional scale. Both the structure itself of the European Union, i.e. streamlined economic legislations that are increasingly comprehensive and touching an ever-expanding range of subjects, and the constant efforts of the EU to enhance integration among Member States, made possible the enactment of a comprehensive and global water policy which created new dynamics for water management. Accordingly, it means that all across the European Union a common integrated water management policy is implemented, which is quite unique. If such a set of common regional measures seems fitted to the structure and organization of the European Union, it is difficult to imagine its implementation in other parts of the world. Not only the WFD prescribes legislation to states, but edicts the administrative structure that states have to establish in order to implement the policy.<sup>176</sup>

This single piece of legislation was aimed at reaching various objectives. First, it is aimed at expanding the scope of water protection to all water, both surface water and groundwater resources. Secondly, through a set deadline, water resources are to acquire a “good” ecological status. To implement these objectives, the EU developed a comprehensive approach to water management based on the principles of Integrated

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<sup>173</sup> Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes, (17 June 1999) (38 ILM 1708).

<sup>174</sup> Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy (23 October 2000) (OJ L 327, 22 December 2000) (hereinafter 2000 EU Water Framework Directive or WFD).

<sup>175</sup> Philippe Sands and Jacqueline Peel, with Adriana Fabra and Ruth Mackenzie, *Principles of international environmental law* (Cambridge University Press, 2012) 319.

<sup>176</sup> 2000 EU Water Framework Directive, Article 3.

River Basin Management (IRBM) to develop more efficient policies. Furthermore, the WFD has the particularity of combining two approaches by setting both emission limit values and quality standards. Lastly, as European law requires, national legislations have to be streamlined to the WFD.<sup>177</sup>

On various levels, the instruments developed by the European Union to better manage water resources are not only in line with international law, but constitute great examples of comprehensive water policies that further implement international standards. In that respect, the international legal framework seems to give solid grounds for the making of regional agreements that would further protect and manage water resources.

Moreover, some cases that have been internationally adjudicated constitute excellent examples of the efficiency of the international legal framework relating to water management. Two landmark cases are to be particularly studied: first, the case concerning the Gabčíkovo-Nagymaros Project and,<sup>178</sup> secondly the case concerning Pulp Mills on the River Uruguay.<sup>179</sup>

The 1997 case concerning the Gabčíkovo-Nagymaros Project clarifies the rules applicable to the management of shared watercourses. The dispute between Hungary and Slovakia (then Czechoslovakia) concerned a 1977 agreement on the construction of two barrages on the Danube River for hydroelectricity production, prevention of flooding and, improvement of navigation. Paragraph 15 of the agreement stipulated that the parties were not to impair the quality of the water of the Danube River. In Hungary, public opinion put pressure on the government regarding the environmental impact of the project until the project was dropped in 1988. After unsuccessful negotiations, Slovakia decided to go on unilaterally with the project, decision that was objected by Hungary and led the parties to ask for the judgment of the ICJ in 1993. The Court was asked to rule on two different points: first, whether Hungary could withdraw from the 1977 agreement and, if Slovakia had the right to proceed with the provisional unilateral solution in its territory. To justify the breach of

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<sup>177</sup> *Introduction to the new EU Water Framework Directive - Environment - European Commission*, (Ec.europa.eu, 2015) <[http://ec.europa.eu/environment/water/water-framework/info/intro\\_en.htm](http://ec.europa.eu/environment/water/water-framework/info/intro_en.htm)> accessed 4 August 2015.

<sup>178</sup> *Case Concerning the Gabčíkovo-Nagymaros Project*, ICJ [25 September 1997] (ICJ Reports 7, 1997).

<sup>179</sup> *Case Concerning Pulp Mills on the River Uruguay (Argentina v Uruguay)*, ICJ Judgment of 20 April 2010, 14, available at <<http://www.icj-cij.org/docket/files/135/15877.pdf>>.

its obligation under the 1977 agreement, Hungary appealed to the doctrine developed by the ILC of “state of ecological necessity”. Under Article 33 of the Draft Articles on International State Responsibility, this doctrine allows the abrogation by a state of an international obligation in the case of a state of necessity. As developed in paragraph 50 of the judgment, this doctrine can exempt the state from its international obligations only when the breach in question constitute the only way to “safeguard an essential interest of the state against a grave and imminent peril”. In paragraph 53, the Court admitted that Hungary’s concerns constituted “an essential interest of the state” but did not acknowledged that the environmental issue arising from this case constituted “a grave and imminent peril” for Hungary. According to the Court in paragraph 54, “a grave and imminent peril” entails a threat to the state’s interests “at the actual time”. Hence, the ICJ did not consider that Hungary was in a “state of ecological necessity” and hence held that it breached its obligations under the 1977 treaty.

On the second point, the Court held that by “unilaterally assuming the control of a shared watercourse, Slovakia deprived Hungary of its right to an equitable and reasonable share” of the water resources of Danube (paragraph 85). Since the 1997 Watercourses Convention had just been adopted, the Court mentioned that the perfect equality of states constituted an acknowledged principle. Therefore, the Court held that Slovakia had undertaken countermeasures that were not proportionate and breached international law.

Consequently, the Court dismissed the claims of both parties and, instructed them to continue negotiations on the basis of international environmental law and the law of international watercourses. In this landmark decision, the ICJ clearly underlined the inviolability of treaties by refusing to discharge Hungary of its obligations under the 1977 treaty and condemned the unilateral decision of Slovakia that would have defeated the purpose of the treaty. Furthermore, the Court advocated for the respect of environmental considerations which greatly influenced its reasoning, as paragraph 53 of the judgment demonstrates: “The environment is not an abstraction but represents a living space, the quality of life and the every health of human beings, including generations unborn. The existence of the general obligation of States to ensure that activities within their jurisdiction respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment”. In that respect, it is worth mentioning



that the Court did not mention the precautionary principle itself but made reference to it in paragraph 113 of its judgment by stating that the parties agreed “on the need to take environmental concerns seriously and to take the required precautionary measures”. In paragraph 112, the Court insisted on the fact that “the awareness of the vulnerability of the environment and the recognition that environmental risks have to be assessed on a continuous basis have become much stronger” than when the parties concluded the 1977 agreement. Later on, the Court made a direct reference to the concept of sustainable development and declared that: “new norms and standards have been developed, set forth in a great number of instruments during the last two decades. Such new norms have to be taken into consideration, and such new standards given proper weight, not only when States contemplate new activities but also when continuing with activities begun in the past. The need to reconcile economic development with protection of the environment is aptly expressed in the concept of sustainable development”.<sup>180</sup> It is clear from these statements that the Court took seriously into considerations the environmental aspects of the project between Hungary and Slovakia. The ICJ had a deep insight into the environmental imperative of the case and highlighted the significant role played by international legal standards in state practice and conflict resolution. However, by instructing the parties to continue negotiations and to find a solution within the framework of the 1977 treaty, the Court seemed reluctant to set forth unequivocally environmental principles that were not fully substantiated at the time.

The efficiency of the international legal framework relating to water management can also be studied through the Case Concerning the Pulp Mills on the River Uruguay.<sup>181</sup> The case concerned a dispute between Uruguay and Argentina under the 1975 Statute when Uruguay authorized the construction of two pulp mills on the river Uruguay, both closely located to Argentina. Argentina considered that Uruguay was in breach of the 1975 Statute and referred the matter to the administrative commission of the river Uruguay or CARU.<sup>182</sup> No settlement was reached under the auspice of the CARU, so Argentina referred the dispute to the ICJ

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<sup>180</sup> *Case Concerning the Gabčíkovo-Nagymaros Project*, ICJ [25 September 1997] (ICJ Reports 7, 1997) Para. 140.

<sup>181</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, ICJ (ICJ Reports 2010) 14.

<sup>182</sup> «Comisión Administradora del Río Uruguay» (administrative commission of the river Uruguay) (hereinafter CARU).

in 2006. Argentina claimed that Uruguay breached provisions of the 1975 Statute relating to prevention of pollution and prescribing measures in accordance with applicable international standards, and procedural requirements relating to prior notification and co-operation and the obligation to prepare an environmental impact assessment.<sup>183</sup> Argentina sought reparation for the injury caused by Uruguay as well as the suspension of the construction of the pulp mills. The Court rejected Argentina request in July 2006 stating that Argentina did not demonstrate that the construction would harm the river, which meant that the requirement of urgency to justify provisional measures was not met.<sup>184</sup>

In September 2006, the construction of one of the mill was abandoned, leaving the other mill (the Botnia mill) that begun to be operational in 2008. Uruguay claimed that as one of the largest river in the world, the river Uruguay was able to absorb the volume of pollution discharged by the Botnia mill, argument that Argentina held false based on its own scientific evidence. In that respect, the Court held that Uruguay breached the procedural obligations contained in the 1975 Statute of information exchange, notification and negotiation with Argentina, but since those were only valid until the end of the negotiation period according to the Statute, Uruguay was then free of proceeding to the construction and operate the mill.<sup>185</sup> As far as the substantive obligations are concerned, Argentina claimed that Uruguay breached Articles 36 and 41 of the 1975 Statute, which respectively state that the parties should prevent any change in the ecological balance of the river and control harmful factors in the river and the areas affected by it and, that the parties should protect and preserve the aquatic environment, especially by preventing its pollution.<sup>186</sup> The Court held that: “a precautionary approach may be relevant in the interpretation and application [...] of the Statute” but did not reverse the burden of proof that was falling on Argentina, the party making the allegation of violation. The Court ruled that Article 1 of the 1995 Statute did not lay specific rights and obligations on the parties relating to optimum and rational utilization of the shared watercourse, which “requires a balance between the Parties’ rights and needs to use the river for economic and commercial activities

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<sup>183</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, ICJ (ICJ Reports 2010) 24.

<sup>184</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, ICJ Provisional Measures, Order of 13 July 2006 (ICJ Reports 2006) 113.

<sup>185</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, ICJ (ICJ Reports 2010) 19, para 157.

<sup>186</sup> *ibid* 19, para 190.

on the one hand, and the obligation to protect it from any damage to the environment that may be caused by such activities, on the other”.<sup>187</sup>

As for the claim made by Argentina that Uruguay breached Article 36 of the Statute, the Court found that the purpose of this article was “to prevent any transboundary pollution liable to change the ecological balance of the river by coordinating, through the CARU, the adoption of the necessary measures”, which put an obligation of conduct on both states. Even though, preserving the ecological balance of the river was of crucial importance, the Court held that Argentina failed to demonstrate that Uruguay refused to engage in co-ordination through the CARU. Hence, there was no breach of Article 36.

As regards Article 41, which has the main effect of preventing pollution and preserving the aquatic environment, the Court also ruled that Uruguay did not act in breach of this article. Article 41 states that the rules taken by the parties to “protect and preserve the aquatic environment” must be “in accordance with applicable international agreements”. Furthermore, under Article 41 the parties undertake to “act with due diligence in respect of all activities which take place under the jurisdiction and control of each party”, which requires the adoption of rules and their monitoring. Consequently, the Court held that a party’s responsibility would be engaged “if it was shown that it had failed to act diligently” and taken “all appropriate measures”.<sup>188</sup> Moreover, the Court mentioned that the obligation to prevent pollution could only be examined in the light of the definition of pollution contained in Article 40 of the Statute. The Court ruled that Argentina failed to demonstrate that Uruguay had “not acted with the requisite degree of due diligence or that the discharges of effluent from the [Botnia] mill have had deleterious effects or caused harm on living resources or to the quality of the water or the ecological balance of the river since it started its operations in November 2007”.<sup>189</sup> By declaring that, the Court held that the environmental impact assessment carried by Uruguay was constitutive of its diligence. Besides, the Court specified that Argentina had “not established” that the inputs of pollutants discharged by the Botnia mill was superior to the limits set by

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<sup>187</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, ICJ (ICJ Reports 2010) 19, para 173 and 175.

<sup>188</sup> *ibid* 19, para. 195-97.

<sup>189</sup> *ibid* 19, para. 265.

CARU.<sup>190</sup> Regarding the argument of Argentina that discharges from the Botnia mill increased the level of concentrations of phenolic substances, the Court held that there was no “clear evidence” to link the increases with the activity of the Botnia mill, there was not “sufficient evidence” proving that the mill harmed the flora and fauna of the area, and no clear evidence that substances having harmful effect on the aquatic environment had been introduced in the river through the mill’s emissions into the air.<sup>191</sup> These last three findings were fiercely fought in the joint dissenting opinion of Judges Simma and Al-Khasawneh. Among others argument, they asserted that the Court was facing scientific results obtained through an inadequate method of scientific fact-finding, which prevented the Court from being in a position to judge whether the substantive obligations of the 1975 were breached.<sup>192</sup> Furthermore, they believed that the Court was “not in a position adequately to assess and weigh complex scientific evidence of the type presented by the Parties”, and that a court of justice cannot assess complex and competing scientific evidence without the help of experts.<sup>193</sup> According to their view, which was shared by Judge Ad Hoc Vinuesa, the role of a court of justice is not to give a scientific assessment but rather to evaluate the claims of the parties beforehand and if founded in law then to proceed to a scientific assessment where one or more experts should have been appointed.<sup>194</sup> In addition, Judge Yusuf, from the majority, expressed concerns on how technical materials were handled by the Court. For example, as far as the hydrodynamic data regarding the flow of the river is concerned, the Court could not appropriately compare situations because the Parties collected their data “from monitoring at different stations, at different depths and on different dates”.<sup>195</sup>

This case allowed the introduction of environmental concerns before the ICJ, even though it is clear from the above, that the assessment of technical and scientific elements by a court of justice is a complex and delicate issue. If issues of international environmental law are becoming more technical, so are the cases arising in front of court of justice. Hence, technical and scientific matters pose significant challenges for

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<sup>190</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, ICJ (ICJ Reports 2010) 19, para. 214.

<sup>191</sup> *ibid* 19, para. 262-64

<sup>192</sup> Joint Dissenting Opinion of Judges Al-Khasawneh and Simma, para. 2.

<sup>193</sup> *ibid* para. 2.

<sup>194</sup> Joint Dissenting Opinion of Judges Al-Khasawneh and Simma, para 4. Dissenting Opinion of Judge Ad Hoc Vinuesa, para 95.

<sup>195</sup> Declaration of Judge Yusuf, para 3.

the making of international environmental law. The appointment of experts constitutes a necessary help that enables judges to better examine the substantive issues and to develop a more accurate appreciation of the scientific and technical details at stake. Science is an ever-evolving discipline that helps better understand our environment, and that makes fluctuate the standards of protection supported by international environmental law. The water field does not escape from this evident conclusion, especially given the complexity of water related issues. For that reason, it is of paramount importance to have panel of experts who can rationally give guidance to legal developments.

#### **4.2 Focus on the UN Watercourses Convention**

The UN Watercourses Convention is a global legal instrument addressing transboundary water issues. The most striking feature of this Convention, that also makes it a landmark instrument in international water law, is the broad definition of word “uses” (of international watercourses) in its Article 1, which allows the Convention to covers a wide range of activities linked to watercourses. As the Convention does not apply to navigational uses, it covers this area only in the extent that navigation may affect other uses or vice-versa, like pollution from vessels. Article 2(a) specifies that the Convention applies to international “watercourses and their waters” which means that the provisions not only apply to the channel itself but also to the interrelated components. But it has to be kept in mind that the Convention is valid for “international watercourses”, which means that parts of the watercourse have to be situated in another states, an international boundary needs to be crossed at some point. Hence, the Convention is not designed to cover internal watercourses, but one can wonder if progressively state practice will integrate the principles included in the Convention in as much to make it state practice even for internal situations. Furthermore, Article 2(a) and (b) specify that the Convention also applies to groundwater systems in the extent that an aquifer is connected to a system of surface waters considered as an international watercourse. An interesting feature relating to the scope of application of this Convention is the fact that the rights and duties carried out by the provisions are only applicable to contracting parties or to other states only in the situation where they are subjected to transboundary harm in the context of an

international watercourse. That being said, the customary rules codified in the Convention are fully applicable to non-contracting parties.

#### *4.2.1 Key Challenges in Managing International Watercourses*

As developed in the Part II of this essay, a sustainable supply of freshwater is the bedrock for the development of societies and life itself. Hence, the variety of factors that underpin the current water crisis constitute a myriad of challenges for the international community. At first sight, water management is considered to be a local issue, but in fact 40% of the world population relies on transboundary freshwater resources.<sup>196</sup> In this respect, convoluted geopolitical relations influence greatly water security and, make the water crisis even more faceted and layered. The increasing divergence between freshwater demand and supply, the unequal repartition of water resources and, the heterogeneous development of water projects constitute strong factors of tension among riparian states. Water scarcity exists in many regions of the world and, affects 20% of the world population.<sup>197</sup> Furthermore, bulk water transfers, defined as the shipping of water tankers across the ocean to respond to the need of water for the production of goods and services of a country, imply that countries who are not sharing any significant international watercourses are reliant on transboundary basins countries. For instance, the island of Malta does not share any international water resources but imports up to 87% of its freshwater.<sup>198</sup> Consequently, the sustainable management of international watercourses not only affects watercourse state but all nations of the world.

The need for stronger water governance is now well acknowledged but the adoption and implementation of effective and global legal instruments is still a major issue. Water insecurity plays a great role in other types of crisis and, its international dimension prevent solutions to be solely based on national strategies. The sustainable management of water, resolving conflict of uses between states ask for the development of effective legal framework at the global level. But, as every each

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<sup>196</sup> UN Watercourses Convention, 'Key Challenges in Managing International Watercourses - UN Watercourses Convention' (Unwatercoursesconvention.org, 2015). <<http://www.unwatercoursesconvention.org/importance/key-challenges-in-managing-international-watercourses>> accessed 8 August 2015.

<sup>197</sup> *ibid.*

<sup>198</sup> *ibid.*

international approach, the loss of sovereignty by states on their natural resources is seen as a threatening subject that prevent them from fully deal with all the aspects of the water issue. In that respect the UN Watercourses Convention constitute a fundamental step toward a global and effective management of water resources worldwide.

#### *4.2.2 The Legal Architecture for Transboundary Water Resources*

According to the United Nations, since 1820 four hundreds agreements relating to water management have been adopted.<sup>199</sup> Over the last 40 years, the legal framework relating to water has developed significantly and efficient legal tools have been adopted. Nonetheless, the international legal framework relating to the regulation of international watercourses is still fragmented. Sixty seven percent of the agreements covering shared watercourses are bilateral.<sup>200</sup> Besides, it is not unusual that two watercourse states adopt a bilateral agreement, excluding other states that share the same international watercourse. According to the UN, 158 of the world 263 international basins are not managed through a cooperative framework.<sup>201</sup> If customary international law and regional treaties cannot be omitted, these numbers show the insufficiency or even lack of a governance framework at the basin level.

Nevertheless, the legal framework for water management differs from various regions of the world. As far as the 59 transboundary river basins of Africa are concerned, 16 are managed through basin-wide agreements, 3 are partly dealt with in agreements and 40 are not covered by any basin-specific agreements.<sup>202</sup> The Revised SADC Protocol on Shared Watercourses System,<sup>203</sup> which contains much of the UN Watercourses Convention, covers the Southern African region and its 15 international watercourses. Angola, Botswana, Congo, Lesotho, Malawi, Mauritius, Mozambique,

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<sup>199</sup> UN Watercourses Convention, 'The Legal Architecture for Transboundary Waters - UN Watercourses Convention' (Unwatercoursesconvention.org, 2015). <<http://www.unwatercoursesconvention.org/importance/key-challenges-in-managing-international-watercourses>> accessed 8 August 2015.

<sup>200</sup> *ibid.*

<sup>201</sup> *ibid.*

<sup>202</sup> *ibid.*

<sup>203</sup> Revised Protocol on Shared Watercourses in the Southern African Development Community (SADC) (28 August 1995, revised 7 August 2000), available at <[http://www.sadc.int/files/3413/6698/6218/Revised\\_Protocol\\_on\\_Shared\\_Watercourses\\_-\\_2000\\_-\\_English.pdf](http://www.sadc.int/files/3413/6698/6218/Revised_Protocol_on_Shared_Watercourses_-_2000_-_English.pdf)>.

Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe have ratified this Protocol.

As for Asia, 57 transboundary river basins are to be found, among which 10 are covered by basin-wide agreements, 15 are only partly covered by an agreement and, 32 are not covered at all.<sup>204</sup>

Europe is home to 64 transboundary river basins, basin-wide agreements apply on 35 of them, 10 are partly covered and 19 are not covered by any basin agreement.<sup>205</sup> But, European states are compelled to implement two strict regional agreements, mentioned before, the 1992 UNECE Water Convention and the EU Water Framework Directive that require commitments furthering the ones of the UN Watercourses Convention.

North America counts 41 transboundary river basins, among which 28 are covered by basin-wide agreements, 4 are partly covered and, 9 have no basin-specific agreements in place.<sup>206</sup>

South America hosts 38 transboundary river basins, 23 of them are covered by basin-wide agreements and 15 are not covered by any type of basin-specific agreements.<sup>207</sup>

A comprehensive analysis of the legal framework for transboundary waters will recognize that numerous global conventions partially affect the water sector, among them: the Ramsar Convention,<sup>208</sup> the Biodiversity Convention,<sup>209</sup> or the Climate Change Convention.<sup>210</sup> The 1971 Ramsar Convention compels its 168 contracting parties to make a careful use of the wetlands within their territory. Article 5 states that “contracting parties shall consult with each other about implementing obligations arising from the Convention, especially in the case of a wetland extending

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<sup>204</sup> UN Watercourses Convention, ‘The Legal Architecture for Transboundary Waters - UN Watercourses Convention’ (Unwatercoursesconvention.org, 2015). <<http://www.unwatercoursesconvention.org/importance/key-challenges-in-managing-international-watercourses>> accessed 8 August 2015.

<sup>205</sup> *ibid.*

<sup>206</sup> *ibid.*

<sup>207</sup> *ibid.*

<sup>208</sup> Convention on Wetlands of International Importance especially as Waterfowl Habitat, (996 UNTS 245; TIAS 11084; 11 ILM 963, 1972) (1972, in force 21 December 1975) (hereinafter Ramsar Convention).

<sup>209</sup> Convention on Biological Diversity (1760 UNTS 79; 31 ILM 818) (Rio de Janeiro, Brazil, 5 June 1992, in force 29 December 1993) (hereinafter CBD).

<sup>210</sup> United Nations Framework Convention on Climate Change (Nairobi 9 May 1992, in force 21 March 1994) (U.N. Doc. A/AC.237/18 (Part II)/Add.1) (UNFCCC).



over the territories of more than one contracting party or where a water system is shared by contracting parties”. This provision is of significant importance in the light of the fact that 30% of the sites covered by the Convention are located in international river basins. Furthermore, the Biodiversity Convention, which supports the sustainable use of the world’s biodiversity, compels its 191 contracting parties to notify, exchange information and enter into consultations when activities within their jurisdiction are likely to significantly affect the biodiversity of other states.<sup>211</sup> In Article 4(e) of the UNFCCC, the 192 contracting parties undertake to “develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods”. The Desertification Convention also covers drought and desertification, its 193 contracting parties undertake to develop “long-term integrated strategies that focus simultaneously, in affected areas, on improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources”.<sup>212</sup> In addition, the greater demand for food that pushes for increasing agricultural production also implies that trade agreement such as the GATT is going to have a growing influence on the legal framework relating to international watercourses.<sup>213</sup>

It is clear from the above that difficulties at the national level such as insufficient water management policies, the weak implementation of agreements, as well as flaws in the agreements themselves make existing agreements insufficient to support integrated water resources management. Consequently, the UN Watercourses Convention constituted a great opportunity to respond to these challenges.

#### *4.2.3 Evolution of the UN Watercourses Convention*

Legal interrogations relating to the management and use of international rivers arose as early as the 1960s. In 1963, the UN General Assembly advised the ILC to “take up

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<sup>211</sup> CBD Article 14(c).

<sup>212</sup> United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNTS 3/ [2000] ATS 18/ 33 ILM 1328) (14 October 1994 in Paris, France, in force 26 December 1996), Article 2.

<sup>213</sup> General Agreement on Tariffs and Trade (1947) (55 UNTS 194; 61 Stat. pt. 5; TIAS 1700) (hereinafter GATT).

the study of the law of the non-navigational uses of international watercourses with a view to its progressive development and codification”.<sup>214</sup> After thirty years, the Draft Articles on the Law of the Non-navigational Uses of International Watercourses were finally adopted.<sup>215</sup> The UN then convened a working group in order to negotiate a convention on the basis of the ILC draft articles. The UN Watercourses Convention was adopted on 21<sup>st</sup> May 1997, after two meetings.<sup>216</sup>

Besides, the International Law Association and the Institute of International Law (IIL) (both non-governmental expert bodies), played a significant role in the development of international law relating to water, also known as international water law. As early as 1961, an independent expert group of the IIL made an attempt at codifying rules relating to international freshwaters at the global level, embodied by the Salzburg Resolution. This Resolution acknowledged the concept of limited sovereignty over international freshwater.<sup>217</sup> In 1966, the ILA adopted the Helsinki Rules on the Uses of Waters of International Rivers, as mentioned in Section 4.1. The Helsinki Rules were of significant influence on the making of later treaties and on state practice, most of the provisions contained in this set of rules are reflected in the UN Watercourses Convention. Lately, the ILA furthered its work of codification and development of international water law and the ILA Committee approved in 2004 the Berlin Rules on Water Resources, which aim at reflecting the customary international law relating to freshwater resources, issue highly debated.<sup>218</sup> This new set of rules intends to replace the Helsinki Rules.

Last but not least, more recently, the ILC has significantly participated in developing international water law, specifically through its work on the law of transboundary aquifers. Indeed, the ILC submitted its draft articles on the law of transboundary aquifers to the UN General Assembly in 2009, and suggested that the UNGA “recommend to States concerned to make appropriate bilateral or regional arrangements for the proper management of their transboundary aquifers on the basis

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<sup>214</sup> UN Resolution 2669(XXV).

<sup>215</sup> ILC, ‘Draft articles on the law of the non-navigational uses of international watercourses’ (Yb ILC 1994, vol. II), Part Two.

<sup>216</sup> UN Watercourses Convention, ‘Evolution of the UN Watercourses Convention’ (Unwatercoursesconvention.org, 2015). <<http://www.unwatercoursesconvention.org/importance/key-challenges-in-managing-international-watercourses>> accessed 8 August 2015.

Unwatercoursesconvention.org, (2015). - *UN Watercourses Convention*.

<sup>217</sup> *ibid.*

<sup>218</sup> ILA, Berlin Rules on Water Resources (71 ILA 337, 385, 2004).

of the principles enunciated in the articles” and “consider, at a later stage, and in view of the importance of the topic, the elaboration of a convention on the basis of the draft articles”.<sup>219</sup>

#### *4.2.4 The UN Watercourses Convention Relationship with the UNECE Water Convention*

Seen as a package, the UN Watercourses Convention and the UNECE Water Convention, acting respectively at the global and regional level, are complementary and mutually reinforcing. They constitute global treaties in force on the same subject matter. Indeed, contracting parties of the 1992 UNECE Water Convention, which entered into force in October 1996, undertake to “prevent, control and reduce transboundary impact”, “use transboundary waters in a reasonable and equitable way [...] [and] ensure their sustainable management”.<sup>220</sup> From a legal standpoint, the two Conventions do not contradict each other. Rather the UNECE presents more detailed requirements than the UNWC, even though both Convention convey the same spirit. Namely, the UNECE Water Convention puts more emphasis on establishing joint agreements and institutional arrangements. Furthermore, the UNECE Water Convention establishes an institutional framework to improve its implementation. This institutional framework is among other things embodied by working groups and meeting of the parties. These particular arrangements have enable to constantly assess and strengthen the implementation of this Convention both at the basin and national levels.<sup>221</sup> Besides, the UNECE Water Convention was amended in 2003 to allow accession by countries outside of the UNECE region.<sup>222</sup> This amendment entered into force on 6 February 2013, and transformed the convention into an international legal instrument for the management of transboundary water resources. Having both

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<sup>219</sup> UN Watercourses Convention, ‘Evolution of the UN Watercourses Convention’ (Unwatercoursesconvention.org, 2015). <<http://www.unwatercoursesconvention.org/importance/key-challenges-in-managing-international-watercourses>> accessed 8 August 2015.

<sup>220</sup> Convention on the Protection and Use of Transboundary Watercourses and International Lakes, (17 March 1992) (31 ILM 1312), Article 3.

<sup>221</sup> UN Watercourses Convention, ‘The Relationship with the UNECE Water Convention’ (Unwatercoursesconvention.org, 2015). <<http://www.unwatercoursesconvention.org/importance/key-challenges-in-managing-international-watercourses>> accessed 8 August 2015.

<sup>222</sup> UNECE, ‘Introduction - About the UNECE Convention’ (UNECE, 2015) <<http://www.unece.org/hk/env/water/text/text.html>> accessed 9 August 2015.

Conventions in force at the global level significantly strengthen the legal framework available for international watercourses.

As a universal instrument, the UNWC lacks provisions relating to governance mechanisms and a body to oversee its implementation. On the contrary, the UNECE Water Convention presents a comprehensive institutional structure that fully oversees its implementation. Furthermore, the knowledge and experience gained through years of implementation is now made available to countries outside the EU. Hence, countries considering adhering in the international legal framework relating to water management will be offered a package of two complementary Conventions that promote shared standards worldwide. The challenge for the international community is now to ensure the coordinated implementation of both Conventions. Various challenges arise from the implementation of both Conventions: the two instruments should reinforce each other while avoiding repetition; ensure that water resources are used as efficiently as possible; build a coherent legal framework for water management; furthermore, the internationally recognized legitimacy of the UNWC should be combined with the twenty years of experience acquired by the UNECE Water Convention, in order to build an efficient transboundary legal water framework. Indeed, having both Conventions existing as global treaties in force constitutes the unprecedented opportunity to build a substantial transboundary water regime for the years to come.

#### *4.2.5 The Benefits of Entry into Force*

It took almost 17 years for the UN Watercourses Convention to enter into force. Numerous interrelated reasons can explain what constituted the barriers to entry into force of one of the first global instrument relating to water management.

First and foremost, as E. Brown Weiss explains that the UNWC was adopted at a time where international environmental law was in exponential expansion, where global agreements relating to climate change, biodiversity and desertification were bursting together with non-binding instruments like the Rio Declaration on Environment and Development<sup>223</sup> or the Agenda 21<sup>224</sup>.<sup>225</sup> The proliferation of

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<sup>223</sup> Rio Declaration on Environment and Development, (UN Doc. A/CONF.151/26 (vol. I)) (13 June 1992 Rio de Janeiro).

international legal agreements and ‘soft law’ instruments relating to the environment and development in the first part of the 1990s, made the UNWC arrive on the desk of national administrative bodies already overloaded, where its implementation was drawn in global situations of treaty congestion.

Furthermore, the slow entry into force of the UN Watercourses Convention is attributed to low awareness and capacity across government ministries and civil community. Hence, almost only specialist lawyers working on transboundary issues pushed for its ratification. Only good levels of awareness from governments and civil societies enable wide promotion and eventually ratification of international agreements like the UNWC.<sup>226</sup>

Lastly, a global lack of support for the ratification of the UNWC was to be observed from the international community. Unlike other multilateral agreements, no key government bodies, UN agencies or regional organizations pushed for a swift ratification process. Nonetheless, the UN launched a wide campaign launched with the World Wide Fund for Nature in 2006 to promote the global relevance of the ratification of the UNWC worldwide, which eventually led to its ratification.<sup>227</sup>

#### *4.2.6 The Importance of Entry into Force*

The entry into force of the UN Watercourses Convention is beneficial on numerous levels. First and foremost, this global treaty dealing with transboundary river basins addresses the problem of fragmentation that the legal framework relating to water management suffers from. Now in force, the UNWC has the potential to legally regulate shared river basins that are not covered by any basin agreement, to guide watercourse states that are not part of an existing agreement, or to supplement agreements that do not cover all the matters addressed by the Convention. In that respect, during the drafting process the Nordic Countries summarized the benefit of signing such an agreement by stating that it “provides a good basis for further negotiations. It leaves the specific rules to be applied to individual watercourses to be

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<sup>224</sup> United Nations, ‘Agenda 21: Programme of Action for Sustainable Development’ (A/Conf.151/26 (14 June 1992).

<sup>225</sup> UN Watercourses Convention, ‘The Barriers to Entry into Force’ (Unwatercoursesconvention.org, 2015). <<http://www.unwatercoursesconvention.org/importance/key-challenges-in-managing-international-watercourses>> accessed 8 August 2015.

<sup>226</sup> *ibid.*

<sup>227</sup> *ibid.*

set out in agreements between States concerned, as has been the current practices”<sup>228</sup>. The 1992 UNECE Water Convention and the 2000 Revised SADC Protocol on Shared Watercourses constitute great regional examples of framework instruments furthering water management at the basin and sub-basin level.

Secondly, the entry into force of the UN Watercourses Convention is beneficial for the development of treaty law. The solid and wide support for the UNWC is likely to help further develop treaty law relating to the environment, for instance the ILC 2008 Draft Articles on Transboundary Aquifers might benefit of the entry into force of the UNWC.

In addition, the recent entry into force of the Convention made a policy statement supporting the necessary cooperation of states in the making of international law relating to international watercourses, lakes and aquifers. Joint development and operations of international watercourses with regards to the principles of equitable and reasonable use and participation are now codified in a legally binding global instrument. It is worth mentioning that in the particular field of water management, the fact that the duty to cooperate is endorsed by an international agreement reinforces its strength as part of customary international law. The UNWC gives the United Nations and other international organizations the legal mandate to supervise and develop transboundary water issues.

Moreover, the recent entry into force is helping raising the awareness of political actors. Now on a higher political agenda, the states that have not ratified the Convention yet might be more assured of the relevance of examining it and undergo such a process.

Lastly, the entry into force of the Convention increases its influential role on what is or what should be customary law in the water field. The more widely ratified the Convention is, the more likely its provisions will be considered customary law and advance the international standards of protection and management of the water resource. At the global level, the entry into force and widespread ratification further the work begun by the ILC to codify, clarify and develop international law of the non-navigational uses of transboundary river basins and to stabilize and improve the legal framework for the management of international watercourses.

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<sup>228</sup> Replies of Governments to the Commission’s questionnaire, (A/CN.4/447) (1993), 164.

## 5. Principles Governing Water Management

### 5.1 International Instruments

#### 5.1.1 Pollution and Permissible Uses of International Watercourses

Industrial effluent, agricultural run-off and domestic sewage discharge constitute the main inputs of pollutants into rivers. As Fuentes explains, the view according to which such polluting uses are impermissible per se is not widely shared and supported by international actors.<sup>229</sup> Only few specific treaties deal with such issues. However, some other treaties partially cover this subject and put an absolute prohibition on altering the quality of rivers. It is more common for states to regulate and control water pollution through the prohibition of certain pollutants discharge, or to establish distinctions between existing and new sources of pollutions.<sup>230</sup>

The European Union early banned the industrial and agricultural discharge of pollutants into river that could have harmful consequences for fisheries activities or domestic uses. The increasing demand for water use by industrial actors progressively shifted this rigid approach toward mixed patterns of legislation. For instance, polluting uses in the Rhine River, which is a major industrial river, are more tolerated than they used to be.<sup>231</sup>

As Boyle points out, this trend is also to be found in North American practice. In the US-Canada Boundary Waters Treaty<sup>232</sup> pollution of boundary water resources is only prohibited when it endangers human health or property.<sup>233</sup> As a matter of fact, before new regulatory rules were signed in 1972, the industrial and agricultural pollution of the Great Lakes was recognized and accepted even if the 1909 Treaty gave clear priority to domestic water use and sanitation. In addition, quality alteration of the water of the Colorado River that was not prohibited or controlled by any other mean than a general obligation stating that pollution resulting from irrigation activities should be “reasonable”. Hence until 1973, the water flowing to Mexico was

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<sup>229</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 547. Referring to: Fuentes (69 BYIL) (1998).

<sup>230</sup> *ibid* 547.

<sup>231</sup> 1956 Convention on the Regulation of the Upper Rhine (UN, Legislative Texts) 660.

<sup>232</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 547. Referring to: 1909 US-Canada Boundary Waters Treaty, Article IV.

<sup>233</sup> *ibid* 548.

not subjected to any precise quality requirements.<sup>234</sup> On a general basis, treaty law did not prohibit polluting uses of river basins. In this regard and quite surprisingly from today's standards, Article 4 of the 1960 Indus River Treaty, which main goal was to control industrial pollutants discharged into the river, considered and respected polluting uses of the river as much as others in accordance with the principle of equitable utilization.<sup>235</sup>

In most cases, state practice relating to the control and management of pollutants, shows that the range of measures taken by states to alleviate water pollution is very narrow. Indeed, states either prohibit the discharge of persistent or highly radioactive pollutants into river basins, or prohibit environmentally harmful uses of international watercourses in the extent that they infringe the rights of other States or treaty provisions. Middle measures are hard to find.<sup>236</sup> What is more, in the context of the pollution of the marine environment, states are progressively pushed to regulate and control river pollution and environmental damages having consequences on the marine environment. This approach has the advantage of putting significant importance on environmental protection.<sup>237</sup>

### *5.1.2 Environmental Harm and Equitable Utilization*

The relationship between the principle of equitable utilization of international watercourses and the control of pollution and environmental harm is highly controversial and has been affecting the making of international watercourses law. In regard of the principle of equitable utilization of shared water resources, when balancing the interests of watercourses states, water quality and environmental protection concerns do not outweigh industrial or irrigation uses. Pollution and environmental damage in general will be legally qualified as wrongful only in the scenario where a coriparian state is deprived of its right to equitable utilization of the shared watercourse. Partisans of this position, argue that the principles of equitable utilization must take precedence over the obligation to prevent potential harm to other

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<sup>234</sup> 1944 Colorado River Treaty (UN, Legislative Texts) 236 and 1973 Agreement on Permanent and Definitive Solution of the International Problem of the Salinity of the Colorado River (12 ILM) (1973) 1105.

<sup>235</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 548.

<sup>236</sup> *ibid* 548.

<sup>237</sup> *ibid* 548.



states.<sup>238</sup> This approach would lead upstream states to develop new uses of shared watercourses that might adversely affect the quality of water resources available for downstream states. This approach would entail that the equitable use by one state of a shared watercourse could cause “significant harm” to another riparian state but still do not constitute a legally wrongful act. From the side of environmental protection, such legal development would be highly detrimental. On the contrary, as stated by the ILC, if “a watercourse state’s right to utilize an international watercourse in an equitable and reasonable manner finds its limit in the duty of that state not to cause appreciable harm to other watercourse states”,<sup>239</sup> then the consent of riparian states, affected by project using shared water resources such as dams, would be required to go on with the project at stake. For this exact reason, upstream and downstream states have been competing over these different approaches when the UN Watercourses Convention was debated at the United Nations.<sup>240</sup>

Parties to the 1966 Helsinki rules clearly undertake to prevent pollution injury “consistent with the principle of equitable utilization”,<sup>241</sup> approach which was in line with the case law developed in the Trail Smelter case.<sup>242</sup> Fortunately for the protection of the environment and the development of international water law, both the 1997 UN Watercourses Convention and the ILC Berlin Articles adopted an alternative approach.<sup>243</sup> The Article 6 of the UNWC states that ecological factors as well as the protection and conservation of the shared water resources are to be taken into account when balancing the equitable use of the river basin. The judgment of the ICJ on the Gabčíkovo-Nagymaros Project, confirms this legal development. Furthermore, Article 7(1) puts a general obligation on states to prevent the causing of significant harm to co-riparian states when using the shared watercourse. This provision does not constitute a complete prohibition but rather an obligation of due diligence. Moreover, Article 20 and 21 call for the protection and preservation of transboundary river basin ecosystems. States must comply with obligations of due

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<sup>238</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 549.

<sup>239</sup> ILC Report (GAOR A/43/10) (1988) 84.

<sup>240</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 549.

<sup>241</sup> Article 10(1).

<sup>242</sup> *Trail Smelter Arbitration (United States v. Canada)*, [1941] (Arbitral Trib., 3 U.N. Report).

<sup>243</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 549.

diligence set forth in these articles independently from claim over equitable use of shared water resources. When, as set in Article 7(2), “despite taking all appropriate measures” significant harm is caused to another watercourse states, then the parties have to negotiate an equitable solution based on the principle of equitable utilization. In case of unavoidable harm, the rights and duties of watercourse states are not established precisely but mitigation and/or compensation by the watercourse state causing the harm will help make the situation equitable again. Taken as a whole, the 1997 UN Watercourses Convention advocates for states to act with due diligence and to prevent the causing of harm to the environment of co-riparian states when using transboundary river basins and, seems to point that such a behavior fall under what generally should be done even within state’s jurisdiction.

It is clear from the above that the general principle of equitable utilization introduces environmental concerns into the allocation of shared water resources, but is of limited importance taken as a basis for exhaustive environmental protection. Equitable utilization has a more persuasive role in settling environmental disputes when it is taken as a part of comprehensive common management regime of international watercourses.

### *5.1.3 Prevention of Pollution and Transboundary Environmental Harm*

It is worth mentioning that the obligation upon states when using water from international watercourses to take all appropriate measures to prevent or alleviate significant transboundary harm, stated in Article 7 of the UN Watercourses Convention is seen as codifying customary international law.<sup>244</sup> The legal discussion about this principle focuses on defining the threshold at which this obligation operates. The ILC suggested at first the wording “appreciable harm” which is subtler than “serious” or “substantial”.<sup>245</sup> The ILC intended to include harm having consequences on health, industry, agriculture, or the environment. The term “significant” adopted in Article 7 and 21(2) of the UNWC seems to only be an adorning change as Article 21(2) states that: “Watercourse States shall, individually

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<sup>244</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 556.

<sup>245</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 554. Referring to ILC Report (GAOR A/43/10) (1988) 85-6.

and, where appropriate, jointly, prevent, reduce and control the pollution of an international watercourse that may cause significant harm to other watercourse States or to their environment, including harm to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the watercourse.”

However, the link between the obligation not to cause harm and the equitable utilization of a watercourse is subjected to the same interpretation in the context of prevention of pollution. Even though, the context and wording of treaties tend to indicate which view is to be prioritized, on a general basis the standard of due diligence in the management of transboundary water pollution is supported by treaty law and state practice. As Boyle points out, the formula of Article 21 of the UNWC “prevent, reduce and control”, indicates that alleviating new or existing sources of pollution ask for different types of measures.<sup>246</sup> Indeed, the same expression was used in Article 194(1) of the United Nations Convention on the Law of the Sea relating to marine pollution.<sup>247</sup> In light of this Convention, “prevent” concerns new pollution of international watercourses, the obligations to “reduce” and “control” concern existing pollution. The requirement that riparian States, “reduce and control” existing pollution mirrors state practice. As the ILC states: “This practice indicates a general willingness to tolerate even significant pollution harm, provided that the watercourse State of origin is making its best efforts to reduce the pollution to a mutually acceptable level”.<sup>248</sup> The same point is evident in Article 2(2) and 3 of the 1992 UNECE Watercourses Convention, as well as in Article 5(a)(b) of the 1999 Rhine Convention.

The obligation of due diligence is substantiated through the obligation of cooperation between watercourse states, which refers to the elaboration and supervision of detailed standards of pollution control and prevention by international river commissions. Article 21(3) of the UNWC promotes mutually agreed measures to alleviate water pollution, such as lists of prohibited and controlled substances, water quality objectives and, the development of techniques to deal respectively with point or diffuse sources of pollution. In that respect, the UNECE Transboundary

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<sup>246</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 556.

<sup>247</sup> United Nations Convention on the Law of the Sea, (1833 UNTS 3; 21 ILM 1261) (1982) (hereinafter UNCLOS).

<sup>248</sup> II YbILC (1994) Pt 2, 122, para. 4.

Watercourses Convention is more detailed and promotes the prevention of pollution at the source, the precautionary principle, the polluter-pays principle, and the needs of future generations. Furthermore, its Article 3 calls for the use of “best available technology” or “best environmental practices” while limiting pollution discharges, the development of non-waste technology to reduce emissions, and to manage water resources through “ecosystems approach”. In addition, the UNECE Watercourses Convention requires environmental impact assessment to monitor transboundary impacts on water resources of new activities. This Convention served as a framework for negotiation of further agreements relating to environmental protection of water resources at the sub-basin level in Europe, such as the 1999 Rhine Convention and the 1994 Danube Convention.<sup>249</sup>

As far as the precautionary principle is concerned, Boyle emphasizes that it is delicate to make absolute assertions in respect of its general applicability.<sup>250</sup> From that perspective, its absence from the 1997 UNWC is not inevitably meaningful. According to the ILC, the principle is suggested in Articles 20 and 21 of the Convention.<sup>251</sup> The principle is supported from its incorporation in the 1992 UNECE Convention and later European agreements relating to water management. Progressively, an increasing number of contemporary agreements relating to water management include the precautionary principle as a way to better control and prevent water pollution.

The obligation to control land-based sources of marine pollution is reflected by state practice. As mentioned before, pollution from rivers constitute one of the aspects of that obligation and it is considered in Article 23 of the UNWC. The latter Article does not detail the content of this obligation further than by stating that states shall take all necessary measures to protect estuaries and the marine environment “taking into account generally accepted international rules and standards”. It is clear from the above that the basis of pollution control in international river basins is now to be found in regional regimes using similar standards of environmental protection relating to water pollution and in the conditions set forth in international cooperation.

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<sup>249</sup> Danube River Protection Convention (1994), <<http://www.icpdr.org/main/icpdr/danube-river-protection-convention>> accessed 10 August 2015.

<sup>250</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 557.

<sup>251</sup> II YbILC (1994) Pt 2, 120, para 9 and 122, para 4.

Customary obligations relating to equitable utilization and harm prevention are no longer playing this role. The main current challenges concern coordinating the management of watercourse and the operation of regional seas commissions in a way that maximizes pollution prevention.

#### *5.1.4 Protection of Watercourse Ecosystems*

Articles 20 and 22 of the UNWC support the protection and preservation of international watercourses ecosystems, while reflecting the provisions of Article 192 and 196 of the 1982 UNCLOS. According to the ILC, Article 5 of the UN Watercourses Convention concerning the optimal protection and sustainable use of international watercourses constitutes the general rule from which Articles 20 and 22 result.<sup>252</sup> The obligation of protection and preservation of ecosystems contained in Article 20 reflect state practice on that matter as well as the work of international organizations. As Boyle points out, this point was adopted without debate in 1997, testifying of the general support for this provision.<sup>253</sup> Moreover, Article 22 of the UNWC prohibits the introduction of alien or new species in international watercourses that may have detrimental effects of the ecosystem of the river basin at stake and hence transboundary impacts on other watercourse states. This last article allows for the protection of international watercourses from pollution beyond simple biological alteration.

Furthermore, the obligation upon watercourse states to “protect” and “preserve” ecosystems from harm or threat calls for their due diligence. According to the ILC, keeping up the ecosystems “in their natural state” is of paramount importance and that both “the protection and preservation of aquatic ecosystems help to ensure their continued viability as life support systems, thus providing an essential basis for sustainable development”.<sup>254</sup> This ILC’s environmentalist understanding of this article seems to advocate for the best protection possible of the environment, which has to be welcomed coming from a influential international organization. Yet, this interpretation goes beyond any approach of equitable utilization of shared water

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<sup>252</sup> II YbILC (1994) Pt 2, 118, para 2.

<sup>253</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 558.

<sup>254</sup> II YbILC (1994) Pt 2, 119, para 3.

resources and is detached from the prudent interpretation of sustainable development developed by the ICJ jurisprudence, such as the Gabčíkovo-Nagymaros Project or Pulp Mills cases.

Although, one can still wonder which ecosystems Article 20 is protecting, other states' ecosystems or the one of the watercourse state. At first sight, the other articles of Part 4 of the UN Watercourses Convention concern harm done to other states and codify customary international law in that respect. Hence, a narrow interpretation of Article 20 would eliminate its application to internal matters, which further narrow the ecosystem approach of the Convention. Once again, the ILC views differ from this interpretation to prefer a more comprehensive approach. According to the ILC, the protection of watercourses ecosystems is part of a more general obligation upon states to protect ecosystems without regards to transboundary repercussions.<sup>255</sup> It highlights the fact that ecosystems management as well as the protection of freshwater resources don't know artificial boundaries and can be only handled at the global scale thanks to state cooperation.

Furthermore, it can be argued that the 1992 UNECE Watercourses Convention further detail the commitment to preserve and protect ecosystems by requiring in its Article 2(2) that parties "ensure conservation and, where necessary, restoration of ecosystems" and in Article 3 "the application of the ecosystems approach" when developing sustainable water resource management. Both of these requirements ask for further positive actions from watercourse states in managing transboundary river basins.

Lastly it has to be mentioned that numerous regional and global treaties contain significant ecological provisions, among them the 1992 Biodiversity Convention or the 1971 Ramsar Convention. The progressive protection of watercourses taken as ecosystem rather than natural resources to be exploited, and the promotion of the sustainable use and development of water resources by international law tend to spread these notions into general state practice and blur the distinction between international and internal watercourses, which further develop and increase the efficiency of international water law.

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<sup>255</sup> II YbILC (1994) Pt 2, 120.

### 5.1.5 Sustainability and Conservation of Water Resources

#### 5.1.5.1 Sustainable Development and Water Resources Law

The principle of equitable use, evolving environmental requirements, as well as growing concerns of sustainable development shape the development of international watercourse law. In the Pulp Mills case the ICJ stated: “the present case highlights the importance of the need to ensure environmental protection of shared natural resources while allowing for sustainable economic development”.<sup>256</sup> The concept of sustainable development can be hardly use as a standard for judicial review, its content is in perpetual evolution and can be best interpreted as an objective governing national and international policies relating to the use of natural resources.<sup>257</sup> Consequently, sustainable development requirements are mainly procedural. It is generally acknowledged that to be qualified of sustainable a policy need to integrate development goals and environmental protection, and take into account the need of present and future generations. Thus it appears that the concept of sustainable development calls to be applied as a universal axiom of development rather than an applied principle for transboundary watercourses management. Indeed, the management of an international watercourse can respect the principle of equitable utilization but in the meantime be contrary to sustainable development considerations, that is to say integrating environmental, development and intergenerational requirements as interpreted by the Rio Declaration. In that respect, the growing concern of the international community for sustainable development considerations will also significantly influence the management of transboundary water resources.

Institutions and policies established by treaty law are also progressively taking into account such considerations.<sup>258</sup> This new perspective completely changes the way natural resources are seen and managed and thus subtly reshapes water resources law. Most of the recent international agreements relating to natural resources recognize the importance of the notion of sustainable development, sustainable use or sustainable management, among them are: 1992 UNECE Convention on Transboundary

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<sup>256</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Provisional Measures, Order of 13 July 2006 (I.C.J. Reports 2006) 113, para 80.

<sup>257</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 561.

<sup>258</sup> *ibid* 562.

Watercourses,<sup>259</sup> 1994 Danube Convention,<sup>260</sup> 1995 Mekong River Basin Agreement,<sup>261</sup> 1995 SADC Protocol on Shared Watercourses,<sup>262</sup> 1997 UN Watercourses Convention,<sup>263</sup> 1999 Rhine Convention,<sup>264</sup> 1999 UNECE Protocol on Water and Health<sup>265</sup> to only cite few. Furthermore, the scope of environmental protection obligations expanded, pollution control and transboundary damage are now joined by comprehensive policies integrating ecological considerations such as the impacts on biodiversity, ecosystems and the marine environment.<sup>266</sup> Policies and decisions relating to watercourse management taken by governments or watercourse commission make increasingly reference to the precautionary principle. It appears that the awareness on the relevance of the sustainable management of water resources is growing among the international community. As Boyle points out, sustainability considerations are not only the prerogative of developed countries and can be found in numerous treaties adopted by developing countries.<sup>267</sup>

This global awareness for sustainable management of water resources is illustrated in the judgment of the ICJ in the Gabčíkovo-Nagymaros Case where the Court found that older watercourse treaties are affected and should be interpreted in light of evolving rules of international law relating to watercourses and by the objective of sustainable development.

#### *5.1.5.2 Sustainable utilization and the right to water*

Article 5 of the UN Watercourses Convention states that: “international watercourse shall be used and developed by watercourse States with a view to attaining optimal and sustainable utilization”. Similarly, Article 3 of the UNECE Transboundary Watercourses Convention enjoins parties to prevent and reduce adverse transboundary repercussions by developing “sustainable water-resources management”.

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<sup>259</sup> Preamble, Articles 3, 4.

<sup>260</sup> Preamble, Article 2.

<sup>261</sup> Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (34 ILM 864) (1995), Article 1.

<sup>262</sup> Preamble, Article 2, with 2000 Revised Protocol, Article 2.

<sup>263</sup> Preamble, Articles 5, 6, 24.

<sup>264</sup> Preamble, Articles 3, 4.

<sup>265</sup> Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes, (UN Doc. MP.WAT/AC.1/1999/1).

<sup>266</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 563.

<sup>267</sup> *ibid* 564.



The sustainable management of water concerns both water quality and water quantity. As far as water quantity is concerned, Fuentes points out that water waste indicates a lack of any real need for the resource.<sup>268</sup> In article 5 of the Helsinki Rules, wasteful use is considered as an equitable factor, the 1997 UNWC speaks of “economy of use” in its Article 6. Further, Article 2 of the 1992 UNECE Watercourses Convention enjoins States to take all appropriate measures: “to ensure [...] [the] conservation of water resources”. The development of stricter standards of water pollution will also greatly improve the amount of available freshwater resources.

In most cases, the issue challenging the management of international watercourses concerns the competition between water uses and then to define which one has priority on the other.<sup>269</sup> If Article 10 of the UNWC seems to put all uses on equal grounds, it gives special consideration for “vital human needs” without giving more details on the content of such needs. Whether drinking and sanitation alone are to be considered or if economic and agricultural needs are also included, is subject to interpretation. In situations of water scarcity, international human rights law gives precedent to human life and health on the grounds of the right to life and to freely dispose of natural resources.<sup>270</sup> In that respect, the UN Committee on Economic, Social and Cultural Rights established that adequate access to drinking water, sanitation, and nutrition supplies were basic rights that States were compelled to provide under Articles 11 and 12 of the 1966 UN Covenant.<sup>271</sup> To some extent, we can be assured that whatsoever the legal status of sustainable development, when basic human rights are neglected unsustainable use or management of water resources violates international human-rights standards. In fact, the international community progressively recognizes the right to have access to water as a new human right.<sup>272</sup> The development of human rights law toward the water field will most definitely

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<sup>268</sup> X. Fuentes, 'Sustainable Development and the Equitable Utilization of International Watercourses' (69 BYIL) (1998) 185.

<sup>269</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 564.

<sup>270</sup> *ibid* 564.

<sup>271</sup> UNCESCR, General Comment No 15 : The Right to Water, (UN Doc E/C 12/2002/11) (2003).

<sup>272</sup> *International Journal of Water Resources Development*, 'The United Nations Concept of Water as a Human Right: A New Paradigm for Old Problems?' (Volume 21 Issue 2, 2005) 273-282. And see: Scanlon, John, Cassar, Angela and Nemes, Noémie, 'Water as a human right?' (IUCN 2004) 3.

influence international water law, especially in situations of water crisis where access to safe drinking water can have tremendous consequences.

#### *5.1.6 Transboundary Environmental Cooperation*

##### *5.1.6.1 Notification, consultation, and negotiation in cases of environmental risk*

The 1997 UN Watercourses Convention,<sup>273</sup> Resolution 2995 of the General Assembly of the United Nations,<sup>274</sup> numerous international codifications,<sup>275</sup> declarations,<sup>276</sup> and case law<sup>277</sup> promote the right for states to prior notice, consultation and negotiation when the use of a shared watercourse can have adverse consequences on their rights or interests. It means that procedural requirements play a significantly role in the equitable utilization of transboundary river basins and enable to avoid disputes among watercourse states over shared water resource. Water pollution and risk of environmental harm trigger the application of these procedural requirements, even in the case of older treaties where they were initially used for mitigating effect on navigation or river flow, their scope of application have expanded.<sup>278</sup>

Prior notification enables to give relevant information to other watercourse states and if necessary lead to consultation. International declarations and treaties concerning the management of international watercourses testify of the general applicability of the obligation to notify. The ILC gives to this obligation the status of customary international law.<sup>279</sup> Articles 12 and 13 of the UNWC state that notifications, allow 6 months for response, must provide sufficient information and include the results of any environmental impact assessment. Reports of the ILC show

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<sup>273</sup> Article 8-9, 11-19.

<sup>274</sup> Resolution 2995 (XXVII) Cooperation between States in the Field of the Environment, (1972).

<sup>275</sup> ILA Berlin Rules, Chs VI, XI ; ILA, Montreal Rules, Articles 5, 6 ; Institute of International Law, 1961 Resolution on the Utilization of Non-Maritime International Waters, Articles 5-8.

<sup>276</sup> 1933 Montevideo Declaration on the Industrial and Agricultural Uses of International Rivers, 28 AJIL Supp (1934) 59-60 ; Stockholm Conference on the Human Environment, 1972, UN Doc, A/Conf48/14, 'Action Plan', Recommendation 51 ; Council of Europe, Recommendation 436 on Fresh Water Pollution Control, 1965, and 1967 European Water Charter, II YbILC (1974) Pt 2, 341ff.

<sup>277</sup> Lac Lanoux Arbitration, (24 ILR) (1957) 101 ; *Gabcikovo-Nagymaros Case*, ICJ Reports (1997) 7 ; *Pulp Mills Case*, ICJ Reports (2006).

<sup>278</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 566.

<sup>279</sup> ILC Report (1988) 115-126.

that most of the time watercourses states include these principles in cooperation treaties over shared watercourses.<sup>280</sup>

Case law from the Lac Lanoux arbitration, the Icelandic Fisheries Case,<sup>281</sup> and the North Sea Continental Shelf Case<sup>282</sup> greatly inspired the 1997 UN Watercourses Convention in its provisions relating to the conduct of consultations and negotiations.<sup>283</sup> Under Article 17 of the Convention, if the implementation of planned measures would lead to a situation of inequitable use or harm another watercourse state, and then respectively breach Articles 5 and 7, parties are enjoined to enter into negotiations to reach an “equitable resolution of the situation”. Even though the dependence on equitable solutions in situations of transboundary harm arouses some difficulties, the obligation under international law to notify and negotiate in order to accord diverging rights and interests recognizes the principle of equitable utilization as the principal basis to allocate rights in the context of shared water resources.<sup>284</sup>

Moreover, the ILC supports the view according to which during the period of reply, negotiation and consultation, good faith enjoins that any plans must be adjourned.<sup>285</sup> To counter any unilateral prolongation of negotiations, which is considered contrary to good faith, the 1997 Convention establishes a time frame of 6 months during which the dispute must be settled. State practice shows a tendency to post-pone, even longer than what is envisaged by the Convention.<sup>286</sup>

#### 5.1.6.2 Information exchange

Another aspect of the obligation to cooperate relates to the regular exchange of data on the state of the shared watercourse. The 1966 Helsinki Rules only recommend such information exchange,<sup>287</sup> while the 2004 Berlin Rules<sup>288</sup> and the UN Watercourses Convention<sup>289</sup> require it. The exchange of information is included in

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<sup>280</sup> ILC Report (125 fff) (1988).

<sup>281</sup> *Fisheries Jurisdiction Cases (United Kingdom v Iceland; Federal Republic of Germany v Iceland)*, ICJ Reports (1973) 3.

<sup>282</sup> *North Sea Continental Shelf Case*, ICJ Reports (1969) 3, paras 85, 87.

<sup>283</sup> ILC Report (1988) 131-3.

<sup>284</sup> ILC Report (1988) 131-3.

<sup>285</sup> 1997 UN Watercourses Convention, Articles 14, 17(3) ; ILC Report (127ff, 130ff) (1988).

<sup>286</sup> ILC Report (1988) 131-3.

<sup>287</sup> Article XXIX(1).

<sup>288</sup> Article 56.

<sup>289</sup> Article 9.

numerous international agreements, declarations and resolutions,<sup>290</sup> like the 1944 US-Mexico Boundary Waters Agreement or the 1960 Indus Waters Treaty. As far as water pollution is concerned, the 1982 Montreal Rules on Water Pollution in an International Drainage Basin<sup>291</sup> enjoins watercourse states to exchange information specifically in the case of water pollution.<sup>292</sup> River basins commissions dealing with pollution have greatly encouraged data exchanges.

#### *5.1.6.3 Emergency cooperation*

Under international law states are compelled to notify each other and cooperate in case of emergency, this rule applies de facto to international watercourses. Treaty provisions about emergency situations in the context of international watercourses concern generally natural disasters, flooding, but few envisage accidental discharge of toxic substances.<sup>293</sup> In case of risk of unexpected increase of water pollution, the ILA Montreal Rules support notification to other watercourse states.<sup>294</sup> Article 28 of the UNWC activates the state of emergency, which covers both natural disaster situations and man-made accident like industrial hazard, as soon as a situation poses “an imminent threat”. In its paragraph 2 it requires states to notify affected States and international organizations “by the most expeditious means available”. The wording of this provision clearly indicates that pollution and environmental emergencies are covered. Furthermore, the Convention requires riparian states not only to notify but to “immediately take all practicable measures necessitated by the circumstances to prevent, mitigate and eliminate harmful effects of the emergency”.<sup>295</sup>

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<sup>290</sup> ILC Report (1988) 106-14.

<sup>291</sup> ILA, ‘Montreal Rules on Water Pollution in an International Drainage Basin’ (1982).

<sup>292</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment* (Oxford University Press 2009) 571.

<sup>293</sup> *ibid* 571.

<sup>294</sup> ILA, ‘Montreal Rules on Water Pollution in an International Drainage Basin’ (1982) Article 5.

<sup>295</sup> Article 28.

## 5.2 Issues on water

### 5.2.1 Principles of Allocation

#### 5.2.1.1 Substantive Equity

The allocation of water resources in transboundary contexts has been one of the first issues dealt with by international law. Water allocation issues have to be apprehended through the relationship between upper and lower riparian states and power considerations between them.<sup>296</sup>

Geographical considerations make upper riparian states in physical control of shared watercourses, since they have the potential to affect both water quality and quantity of the stream. For instance, the Euphrates-Tigris river basin constitute a typical example where the upstream state, Turkey, has a veto power over the downstream states, Syria and Iraq, because of the importance of its economic and military dominance. In some cases, inaction from upstream states gives the possibility to downstream states to take effective control of the watercourse. In many cases, downstream states have developed into agricultural states and then claimed prior rights over the watercourses because of their agricultural-driven development that veto future use of upstream states.<sup>297</sup> Egypt constitutes a classic example of a downstream state that has taken control of the watercourse and is able to effectively veto future development of upstream states, Sudan and Ethiopia, because of its economic and military power over them.

Both Louka and Boyle list four different doctrines that can be found in practice: first, absolute territorial sovereignty where the upstream state have absolute power over the watercourse; second, absolute territorial integrity where the upstream state can not do anything that would have detrimental effects on the flow of the watercourse downstream; third, limited territorial sovereignty where watercourse states can do what pleases them as long as no harm is made to other watercourse states; and last, community of interests and equitable use where a wide range of factors are taken into account by watercourse states to decide what would be an

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<sup>296</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 172.

<sup>297</sup> *ibid* 172.

equitable allocation of the shared resource.<sup>298</sup> The 1997 UN Watercourses Convention develops the latter concept. It is worth mentioning that since the management of watercourses is the result of open-ended negotiations from co-riparian states, anything that is agreed on is said to constitute the basis of equitable utilization. Hence political power games undermine greatly the objective of fairness and equitability carried by international conventions.

In regional contexts, the apportionment of water resources is subjected to the principle of equitable utilization and the obligation not to cause significant harm, but this apportionment is also greatly shaped by power configuration in the region.<sup>299</sup> The relationships among co-riparian evolve in the shadow of watercourse states' economic development and capacity to build infrastructure. Weak countries must also face the difficulties of gathering data and information just to be able to enter into negotiations with other co-riparian states. Indeed, political aspects of institutional development play a significant role in the allocation of water resources, especially in developing countries. Disconnecting water issues from power configuration would only give an artificial comprehension of water conflicts. In the Middle East for instance, broad security concerns would have a significant influence on the outcome of an agreement on water utilization.<sup>300</sup>

It is clear from the above that the concept of equitable utilization is adaptive to regional circumstances. This phenomenon is well summarized by Louka when he says that: "successful negotiation of international water allocation treaties often involves a quick passage from a rights discourse to a needs discourse".<sup>301</sup>

#### *5.2.1.2 Procedural Equity and Institutional Development*

All regional treaties establish an institution, usually named "commission", that is in charge of collecting data, performing studies, encourage consensus between watercourse states and provide a framework to settle conflicts. It is very unusual that commissions supervise disputes settlement or make decisions over water allocation or

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<sup>298</sup> Patricia Birnie, Alan Boyle, Catherine Redgwell, *International law and the environment*. (Oxford University Press 2009) 540. And Elli Louka, *International environmental law* (Cambridge University Press 2006) 173.

<sup>299</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 174.

<sup>300</sup> *ibid* 174.

<sup>301</sup> *ibid* 175.

use. Indeed, Commissions have a technical role, and thus are composed of an equal number of representatives from all watercourse states signatories of a regional freshwater agreement whom are more technical experts than politicians.<sup>302</sup>

Institutional development in watercourses management has significantly helped implementing equity considerations. Commissions enable all co-riparian states to express their concerns and interests over shared water resources. Commissions provide procedural framework that enable equitable allocation of resources.<sup>303</sup> Furthermore, the fact of having experts rather than politicians around the table desensitizes conflicts. In region with high level of integration, such as the European Union, Commissions have the capacity to not only to assist states but also users. Indeed, under the Water Framework Directive of the European Union, basin commissions have the mission of promoting public participation in the decision-making process.

Last but not least, institutional development in the water sector through commissions or River Basin Organizations (RBOs) soothes and stabilizes relationships between co-riparian states, which in some cases is of greater importance than the sole allocations of water resources among watercourse states.

### *5.2.2 Efficiency and quality*

Water quality is an issue barely dealt with by international treaties. However, issues of water quality and water quantity are fundamentally intertwined. For instance, an increased level of pollution in a water flow makes significantly decrease the quantity of water of proper quality available for use, which means that water needs of other co-riparian states won't be met.

Furthermore, water efficiency is also an issue intrinsically linked to water quality. Water of mediocre quality for a particular use is de facto going to lead to water waste. In most countries, agriculture is supported by considerable subsidies that maintain a system with high water wastage. Agriculture is also one of the main causes of diffuse pollution because of the use of substances like nitrates and fertilizers that wind up in water resources.<sup>304</sup> Though, farmers considering that they are entitled to

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<sup>302</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 175.

<sup>303</sup> *ibid* 176.

<sup>304</sup> *ibid* 180.

water supplies have opposed adjusting the price of water to the cost of its production. In that context, industrial use of water are favored by mechanisms of water allocation because the industrial sector have less viewed the provision of water as an entitlement and hence are more ready to pay its true cost.<sup>305</sup>

Efficient water allocation policies tried to internalize the costs of water production; this has been materialized by privatization in some countries and generally by increased prices. This mechanism was expected to better allocate the resource, for example toward industrial uses rather than agricultural ones.<sup>306</sup>

However, these attempts to regulate the demand for water resources – what has been called demand-led management of water resources – make the water a commodity that is priced and generates profit.<sup>307</sup> Some groups have claimed that the provision of water constituted a human right and could not be traded.<sup>308</sup> Indeed, the UNGA adopted a resolution in 2010 raising access to water and sanitation to the rank of human right, consecrating that human dignity is dependent of proper access to water and basic sanitation.<sup>309</sup> Ultimately, it is the consumer that pays the price of the internalization of the costs of production and this mechanism is likely to threaten the survival of the poorest fringes of societies. Indeed, for some poor constituencies affording the water prices asked by private companies has become a pressing issue, especially in developing countries.<sup>310</sup> As Louka summarizes, two paradigms surrounding water management are brought into conflict: water as a social good versus water as an economic good.<sup>311</sup>

In that respect, the 1997 UN Watercourses Convention does not clearly tackle the issue of water efficiency. In its Article 6(1) it states that when establishing equitable allocation of water resources “economy” is one of the factors to be taken

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<sup>305</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 180.

<sup>306</sup> *ibid* 180.

<sup>307</sup> *ibid* 180.

<sup>308</sup> International Journal of Water Resources Development, ‘The United Nations Concept of Water as a Human Right: A New Paradigm for Old Problems?’ (Volume 21 Issue 2, 2005) 273-282). And see: Scanlon, John, Cassar, Angela and Nemes, Noémie, ‘Water as a human right?’ (IUCN 2004) 3. UNCESCR, General Comment No 15 : The Right to Water, UN Doc E/C 12/2002/11 (2003).

<sup>309</sup> UNGA Resolution, *The human right to water and sanitation*, (A/RES/64/292) (28 July 2010).

<sup>310</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 181.

<sup>311</sup> *ibid* 181.



into account as “the costs of measures taken to that effect”, which does not provide a clear cost-benefit analysis of the resource.<sup>312</sup>

The European Union Water Framework Directive faced a strong opposition from Member States to introduce water pricing. Indeed, given the strong agricultural sector in Europe, water pricing would have a significant financial impact. Hence, it is clear from the above that water pricing is an issue that is politically sensitive, even in a highly integrated region such as Europe.<sup>313</sup>

### *5.2.3 Integrated Water Resources Management*

Integrated Water Resources Management or IWRM promotes a new way of managing river basins in an integrated manner that takes into account a variety of factors, such as: physical, ecological and chemical characteristics of water; the various interests of parties; environmental components like managing pollution; wide participation on the decision-making process; and, the coordination of different levels of decision, i.e. local departments and agencies.<sup>314</sup>

IWRM manages river basins as hydrological units by taking into accounts both impacts and uses, that is to say fishing activities, pollutants from industrial and agricultural uses, tourism, etc. One of the key aspects of IWRM are River Basin Organizations (RBO) – i.e. commissions – that coordinate water policies between the national and the local level in an integrated manner.<sup>315</sup>

The efficiency of integrated water resources management policies has been progressively recognized worldwide and many countries around the globe have developed such policies through river basin organizations. If these organizations differ from one country to another in respect to their name and their functional independence, they share some main characteristics, like taking hydrological unit as the basis of their mandate, include the public as much as possible into the decision-making process, and lastly, being coordinator and manager of water management policies.<sup>316</sup>

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<sup>312</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 181.

<sup>313</sup> *ibid* 182.

<sup>314</sup> *ibid* 182.

<sup>315</sup> *ibid* 182.

<sup>316</sup> *ibid* 183.

At the global level, United Nations agencies and international development assistance programs have promoted the IWRM approach as a standard of international water law.<sup>317</sup> Many environmental non-governmental organizations have also supported this approach. Agenda 21 puts forward IWRM to deal with water issues through measures such as mandatory environmental impact assessment, risk management and protection of groundwater resources.<sup>318</sup> Moreover, in this perspective of comprehensive management of water resources Agenda 21 enjoins states to cooperate for unifying strategies and action programs.<sup>319</sup> Furthermore, the WSSD Implementation Plan directly refers to IWRM to develop water efficiency.<sup>320</sup>

Even though state practice shows some cooperation between states for managing shared watercourses, IWRM has not been the leading principle in the making of agreements. Comprehensive international treaties integrating both water quantity and quality issues are scarce. The fact that both the 1997 Watercourses Convention and the 2000 SADC Protocol, which are comprehensive water arrangements, have been reluctant to develop IWRM policies can be explained by the fact that states are afraid of transferring sovereignty. Indeed, by apprehending watercourses as systems, IWRM includes and controls land-based activities having adverse effects on water resources.<sup>321</sup>

## **Part IV. What can we see of the future?**

### **6. Progress towards the Millennium Development Goals and Beyond**

The Millennium Development Goals' agenda draw to a close in 2015, while significant improvements have to be welcomed in relation to water management; the road toward sustainable water for all is still long. Namely, this is the new goal for water of the United Nations for the post-2015 period that builds on and further develops existing commitments.

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<sup>317</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 184.

<sup>318</sup> Agenda 21, Chapter 1, Section 4.2, Para. 18.40(d).

<sup>319</sup> Agenda 21, Chapter 1, Section 4.2, Para. 18.10.

<sup>320</sup> WSSD, Plan of Implementation, Chapter 1, Section 4.3, Para. 25.

<sup>321</sup> Elli Louka, *International environmental law* (Cambridge University Press 2006) 185.

## 6.1 Global Progress towards achieving the MDGs

The Millennium Declaration, signed by the Member States of the UN in 2000, engendered the Millennium Development Goals (MDGs).<sup>322</sup> Goal 7 is dedicated to ensure environmental sustainability and, among other targets, aimed at dividing by two by 2015 the number of people without sustainable access to safe drinking water and basic sanitation. The Joint Monitoring Program for Water Supply and Sanitation (JMP) of the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) kept track of the progress towards the MDG targets worldwide, and published a report entitled *Progress on Sanitation and Drinking Water - 2015 Update and MDG Assessment*, from which most of the data of this section is taken from.

In a nutshell, if considerable progress in water and sanitation has been made, much is still ahead.

In 2015 the MDG period runs its course. It was the vision of the world leaders that shaped the eight Millennium Development Goals, which aimed at fighting poverty. But how has the global progress toward achieving the MDGs been and what is the legacy it leaves behind?

Data gathered in the United Nations' "The Millennium Development Goals Report" from 2015 shows indications of this progress. Data in the report shows both the great progress reached by the strategies implemented on bases of the MDGs and the shortcomings in many areas.<sup>323</sup> Even though there has been great success in many of the MDG targets all over the world, many people are being overlooked and it is particularly the poorest and the disadvantaged because of sex, age, ethnicity, geographic location or disability who are the most vulnerable people and who suffer the most from that.<sup>324</sup> As an example the report states that "about 16 per cent of the rural population do not use improved drinking water sources, compared to 4 per cent of the urban population."<sup>325</sup> In the urban areas 18 per cent of people lack improved sanitation facilities, compared to half the people living in rural areas.<sup>326</sup> Around 40 per cent of the world population is affected by water scarcity, which is estimated to increase. Since the sustenance of poor people is more closely linked to natural

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<sup>322</sup> UNICEF/WHO *Progress on Sanitation and Drinking Water - 2015 Update and MDG Assessment*, (2015) 2.

<sup>323</sup> United Nations, *The Millennium Development Goals Report 2015* (2015), 4.

<sup>324</sup> *ibid* 8.

<sup>325</sup> *ibid* 8.

<sup>326</sup> *ibid* 8.

resources and they are more likely to live in areas that are the most vulnerable, the debasement of the environment hits them the hardest.<sup>327</sup>

Goal 7 of the MDG is to ensure environmental sustainability. Target 7.A aims to “integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources”.<sup>328</sup> As developed above, the integration of water issues into the making of global policies is a key aspect of improving the management of global water resources but also in achieving human development goals.

Target 7.C aims to “halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation”. In 25 years, or from 1990, 2.6 billion people have gained access to improved drinking water source so now 91 per cent of the global population is using an improved drinking water source. Furthermore 1.9 billion people of the 2.6 billion now use a piped drinking water supply on premises. This higher level of service now reaches over half of the population or 58 per cent.<sup>329</sup> In the same time there has been a decrease from 346 million to 159 million of people using surface water.<sup>330</sup>

The UN report states that “access to improved drinking water” has been reached in Eastern Asia, Latin America and the Caribbean, South-Eastern Asia, Southern Asia and Western Asia. Even though Sub-Saharan Africa did not reach the target there was still a 20 percent rise in the use of improved sources of drinking water.<sup>331</sup> Predictions say that in 2015 improved drinking water sources are still unavailable for 663 million people and almost half of them living in Sub-Saharan Africa compared to one-fifth living in South Asia.<sup>332</sup>

Over the same period there has been an increase from 54 percent to 68 per cent in the proportion of the population who now has access to, and is using, improved sanitation facility. People practicing open defecation has decreased from 24 per cent to 13 per cent of the population but in 2015 this is still practiced by 946 million people. People without access to improved sanitation facilities are 2.4 billion in 2015. The target of better access to improved sanitation has been reached Caucasus and

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<sup>327</sup> United Nations, *The Millennium Development Goals Report 2015* (2015), 8.

<sup>328</sup> *ibid* 52.

<sup>329</sup> *ibid* 58.

<sup>330</sup> *ibid* 58.

<sup>331</sup> *ibid* 58.

<sup>332</sup> *ibid* 58.

Central Asia, Eastern Asia, Northern Africa and Western Asia.<sup>333</sup> According to the statistic in the report “147 countries have met the drinking water target, 95 countries have met the sanitation target and 77 countries have met both”.<sup>334</sup>

Great progress has been made in the before mentioned targets with now 16 per cent of the global rural population that is still without access to improved drinking water but this proportion was 38 per cent in 1990. In 2015, 96 per cent of the population in urban areas is using better drinking water sources. When it comes to improved sanitation there has been a drop from 38 per cent to 25 per cent of those in global rural areas that are still practicing open defecation, while there has been almost a 25 per cent drop of people in the same areas without access to improved sanitation.<sup>335</sup> There is still a long way to go and it hits the people in rural areas and the poor and marginalized groups the hardest. The people in those groups are more likely to be still exposed to a lack of sanitation or bad drinking water.<sup>336</sup>

It is crucial to focus on environmental sustainability in the socioeconomic development and the fight against poverty. In order to improve the lives of the global population it is important to have healthy and strong ecosystems and to improve the above-mentioned factors.<sup>337</sup> Water plays a significant role in that scenario.

## **6.2 UN Global Goal for Water: “Securing Sustainable Water for All”**

Today’s patterns of water use, development and management have proved to be unsustainable to say the least. At the Rio+20 Conference on sustainable development governments acknowledged that water was “at the core of sustainable development as it is closely linked to a number of key global challenges”. Indeed, better managing water resources significantly help achieving other key objectives such as ending poverty, achieving human rights for all, boost sustainable economic development. The new goal designed by the United Nations of “Securing a sustainable water for all” intends to further achieve the objectives agreed on at Rio+20. This new goal is seen as a guiding objective for the current discussions at the global level about a new agenda surrounding water management. Through this global water goal, the UN intends to

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<sup>333</sup> United Nations, *The Millennium Development Goals Report 2015* (2015), 58.

<sup>334</sup> *ibid* 58.

<sup>335</sup> *ibid* 59.

<sup>336</sup> *ibid* 59.

<sup>337</sup> *ibid* 61.

help advance human well-being, economic prosperity and the protection of the environment. Hence, this new water framework for development integrates the three aspects of sustainable development: social, economic and environmental.<sup>338</sup> The MDGs developed and implemented an agenda for the period 2000-2015 that the Sustainable Development Goals (SDGs) intend to further for the post-2015 period so as to secure sustainable water for all. The Sustainable Development Goals will build on the progress and the lessons that the MDGs leave behind.<sup>339</sup>

The objective of this post-2015 agenda is to keep on improving drinking water and sanitation needs worldwide, as well as meeting energy and agriculture uses, while protecting water resources from over-exploitation and pollution. To achieve the global goal of securing sustainable water for all, UN-Water has developed five targets corresponding to SDGs: promote the sustainable use and development of water resources worldwide; encourage equitable and accountable water governance while promoting participation; reduce mortality and economic cost of water-related disasters; reduce untreated wastewater discharge and nutrient pollution while developing water reuse; and, strengthen universal access to safe drinking water, sanitation and hygiene.<sup>340</sup>

#### *6.2.1 A Global Goal for Water...*

Water is at the core of economic development, healthy ecosystems, and human survival. Hence, water is a fundamental aspect of sustainable development. Progressively the global community has grown aware of the necessity to change the way the world functions. The concept of sustainability is at the core of this awareness. Indeed, every aspect of development, could it be economic, social or environmental, is intertwined with the other and can have significant adverse effects. Hence, sustainable development supports integrated policies where economic concerns, human well-being and the preservation of the environmental capital are fundamental.

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<sup>338</sup> UN-Water, *A Post-2015 Global Goal for Water : Synthesis of key findings and recommendations* (27 January 2014), 3.

<sup>339</sup> United Nations, *The Millennium Development Goals Report 2015* (2015), 3-4.

<sup>340</sup> UN-Water, *A Post-2015 Global Goal for Water : Synthesis of key findings and recommendations* (27 January 2014), 3.

Sustainable development belongs to the long-term planning, managing resources for future generations.<sup>341</sup>

Having a universal dedicated goal for water –Securing sustainable water for all- enables to develop comprehensive policies, in opposition with a current fragmented water framework. Building on the MDGs, give to the international community the opportunity to give a new impetus in water policies through a mature and innovative framework.<sup>342</sup>

### 6.2.2 ... *Building on Existing Commitments*

Numerous commitments have already been made on water and sanitation. The new SDGs testify of the continuous efforts made by the international community to improve water-related issues.

The United Nations Conference on Sustainable Development or Rio+20 in 2012 evaluated the progress made since the Rio Conference towards sustainable development. UN Member States agreed to launch a new water policy carried by Sustainable Development Goals, building on the MDGs. The outcome document “The Future We Want” confirms the commitment made in 2000 at the Millennium Assembly and at the WSSD in 2002 while committing to new global goal and targets for water.<sup>343</sup>

Furthermore, this new policy on water supports the human right for access to safe drinking water and sanitation. As the UN points out, this right is already included in numerous international conventions and treaties such as the Convention on the Elimination of Discrimination Against Women (1979), the Convention on the Rights of the Child (1989) or the Convention on the Rights of Persons with Disabilities (2006).<sup>344</sup> The General Comment n°15 of the 2002 International Covenant on Economic, Social and Cultural Rights of 1976, as well as Resolutions from the UNGA also support a human right for access to water and specify that under this

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<sup>341</sup> UN-Water, *A Post-2015 Global Goal for Water : Synthesis of key findings and recommendations* (27 January 2014), 7.

<sup>342</sup> *ibid* 7.

<sup>343</sup> United Nations, *The Future We Want* (A/RES/66/288) (2012) 3.

<sup>344</sup> UN-Water, *A Post-2015 Global Goal for Water : Synthesis of key findings and recommendations* (27 January 2014), 11.

obligation, states are compelled to make efforts to realize this right and to take legislative measures in that respect, despite situations of resource constraints.<sup>345</sup>

Better managing water resources have been of the interest of UN Member States for more than twenty years. Indeed, the Earth Summits, Agenda 21, MDG target 7A and 7C, Article 25 and 26 of the 2002 Johannesburg Plan of Implementation, all work toward improving the development and use of water resources.<sup>346</sup>

Furthermore, the United Nations Framework Convention on Climate Change that is designed to avoid “dangerous” human influence on the climate system, put water resources at the center of its action to achieve its goals.<sup>347</sup>

A 2012 UN survey showed that more than 130 countries adopted integrated policies for water management, even though great challenges are still ahead, especially coordinating growing water demand and finite fresh water resources.<sup>348</sup>

Moreover, Target 14 of the 10<sup>th</sup> Conference of the Parties of the Convention on Biological Diversity (2010) declared: “By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into accounts the need of women, indigenous and local communities and the poor and vulnerable”.<sup>349</sup>

It is clear from the above that “The Future We Want” constitutes the latest step of the international community to develop and implement sustainable development and uses of water resources. Accordingly, by learning from previous commitments and efforts, the SDGs renew targets to bring population around the world closer to secure sustainable water resources.

### *6.2.3 Detailed Targets and Desired Outcome*

To achieve the new main goal for water policies- Securing sustainable water for all-, the UN decided on five targets to achieve by 2030.

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<sup>345</sup> UN-Water, *A Post-2015 Global Goal for Water : Synthesis of key findings and recommendations* (27 January 2014), 11.

<sup>346</sup> *ibid* 11.

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<sup>348</sup> UNEP, *The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management* (2012).

<sup>349</sup> UNEP, *10<sup>th</sup> Conference of the Parties to the Convention on Biological Diversity*, (UNEP/CBD/COP/10/27) (Japan 2010) 119.



First and foremost, Target A entails achieving universal access to safe drinking water, sanitation and hygiene. To achieve this goal, UN-Water enjoins “to eliminate open defecation”, “to achieve universal access to basic drinking water, sanitation and hygiene for households, schools and health facilities”, “to halve the proportion of population without access at home to safely managed drinking water and sanitation services”, and “to progressively eliminate inequalities in access”.<sup>350</sup> These strategies aim at promoting child survival and nutrition, as well as curtailing extreme poverty. In addition, this first goal will help reduce the burden of water related diseases on poor populations.<sup>351</sup>

Target B is dedicated to “Improve by (x%)”<sup>352</sup> the sustainable use and development of water resources in all countries”. Three elements are taken into account to achieve this goal: “Bring freshwater withdrawals in line with sustainably available water resources”, “Restore and maintain ecosystems to provide water-related services”, and “Increase water productivity for all uses”.<sup>353</sup> Target B will enable countries to ensure sustainable withdrawals in the long term that would improve water quality and hence the quantity available.<sup>354</sup>

Target C enjoins “All countries [to] strengthen equitable, participatory and accountable water governance” through the implantation of “integrated approaches to water management at local, basin and national levels including participatory decision-making”, by delivering water in a sustainable and affordable manner, by encouraging national legislation in that sense, and by transferring knowledge. In that scenario, “countries [would] have an enabling environment” to support integrated approach at different levels, as well as a “National Development Plans” that would give targets adapted to local circumstances and would prepare societies to absorb the shock of disasters (natural or due to human activity).<sup>355</sup>

Target D is dedicated to “reduce wastewater pollution and improve water quality by reducing untreated domestic and industrial wastewater by (x%); increasing

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<sup>350</sup> UN-Water, *A Post-2015 Global Goal for Water : Synthesis of key findings and recommendations* (27 January 2014), 37.

<sup>351</sup> *ibid* 38.

<sup>352</sup> No precise commitments have been made at the time of writing, sentences appear here exactly as they are in UN documents.

<sup>353</sup> UN-Water, *A Post-2015 Global Goal for Water : Synthesis of key findings and recommendations* (27 January 2014), 38.

<sup>354</sup> *ibid* 38.

<sup>355</sup> *ibid* 39.

wastewater reused safely by (y%); and reducing nutrient pollution by (z%) to maximize water resource availability and improve water quality”. This comprehensive target will be materialized through reducing the overall amount of wastewater through national campaigns, increase the amount of reused wastewater, and lastly by decreasing nutrient pollution.<sup>356</sup> These actions will allow to better protect not only human health but the environment and ecosystems, as well as promoting sustainably water supplies, and reduce the various impacts of diffuse pollution.<sup>357</sup>

The last target aims at reducing “mortality by (x%) and economic loss by (y%) from natural and human-induced water-related disasters”. In order to do so, the United Nations want to improve universal knowledge on climate change, and develop at the national level comprehensive policies of risk-management that implies precise monitoring. These improvements will enable communities to have early warnings and be better prepared to absorb these dramatic shocks, for countries to understand and address the root causes of such phenomenon, and to reduce economic losses.<sup>358</sup>

## 7. Conclusion

Water management constitutes one of the most crucial environmental challenges that states have to face today. The international legal framework relating to water management focused for most of its history on allocation issues and use of transboundary water resources. Only recently, international instruments have addressed water conservation and protection issues. Indeed, the international community has progressively recognized the importance of conservation and sustainable use of water resources at the global scale. The requirements attached to these new concerns affect greatly how international watercourses are managed and are gradually incorporated in international instruments such as the 1997 UN Watercourses Convention, which constitutes a fundamental step toward a global and effective management of water resources worldwide.

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<sup>356</sup> UN-Water, *A Post-2015 Global Goal for Water : Synthesis of key findings and recommendations* (27 January 2014), 40.

<sup>357</sup> *ibid* 40.

<sup>358</sup> *ibid* 41.

In the context of international watercourses, states can no longer pollute freely water resources or devastate river basins ecosystems, mainly because of the obligations not to cause significant harm in areas beyond their jurisdiction or to the marine environment. However, it is thorny to draw a conclusion about the efficiency of the overall body of international water law. First, because determining what is a “good” level of protection is a subjective issue that differs from one country to another; and secondly, because the diversity in scope and content of regional and bilateral agreements establish a variety of watercourse systems. Also, the jurisprudence and state practice in regard to pollution control and environmental protection is quite recent and sparse.

The 1997 UN Watercourses Convention has the quality of codifying international customary law in the field. However, the relationship between the principle of equitable utilization and obligation to prevent harm is problematic. This is less difficult concerning pollution control since state control over pollution is fairly accepted.

International water law is also governed by international agreements not specifically developed for water management. Indeed, the law of the sea is efficient to prevent pollution that affects the marine environment. Furthermore, watercourses host ecological habitats for wildlife and migratory species that are severely disturbed by substantial manipulations of water such as dams, or the re-routing of rivers and the draining of wetlands. In that context, international instruments concerning fisheries and living resources in general are particularly relevant for the broad ecological protection of watercourses.

The principle of equitable utilization is considered to be a core principle of international watercourse law, if it is true when used for allocating shared water resources between riparian states; the principle constitutes an inadequate basis to develop comprehensive environmental protection of a watercourse taken as an ecosystem. In addition, the principle of equitable utilization does not integrate ecological, developmental and inter-generational concerns embodied in the concept of sustainable development that is predominant in modern water resources policy.

As it is today, the international legal framework relating to water establishes global standards of protection and sets common procedural requirements that help better manage the resource. But these minimal standards are basic and need to be further implemented to protect in practice water resources.

On the one hand, these standards have evolved through time and tend to incorporate more and more elements, such as land-based pollution, ecosystems, and marine resources. In that respect, great progress has been made. It seems that the next step would be to incorporate the concept of Integrated Water Resources Management in international instruments. As mentioned before, states are reluctant to do so because of concerns about their sovereignty. The integration of all fields of policy into water management appears to be the only way to truly protect and conserve the water resource in the long run. In that perspective, the regulations adopted by the European Union, and especially the 2000 Water Framework Directive, are to be especially welcomed. The outcome of the meeting of the world leaders at the COP 21 on Climate next December in Paris is also going to greatly influence the making of international water law.

On the other hand, it has to be highlighted that while water is a vital resource for every aspect of life on Earth, that freshwater ecosystems are the nest of essential services for human well being; every day, intensive patterns of water consumption, poor river-basins management, the multiple effects of climate change, as well as strong population growth put an increasing pressure on the resource, making the problem everyday more alarming. As Nicholas Stern pointed out in its famous report on climate change, in the long run the costs of inaction are greater than the costs of action and sometimes the changes are irreversible.<sup>359</sup> Furthermore, international legal standards on water only apply to international watercourses, hence internal rivers, lakes, groundwater aquifers are not subjected to any of those requirements as long as they do not harm neighbors or the marine environment. In a word, the need for stronger water governance is now well acknowledged but the adoption and implementation of effective and global legal instruments is still a major issue.

Lastly, water insecurity plays a great role in other types of crisis. Namely, the intensification of extreme weather events, such as droughts, affects significantly some region of the world and the stability of their political institutions. Indeed, the regulation of the development and use of water resources constitute an essential factor in building global peace and security. Earth works as a huge ecosystem where actions in China can have repercussions in Egypt. Our world is globalized even in terms of

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<sup>359</sup> Nicholas Stern, *The Economics of Climate Change*, (American Economic Review, v.98, 2008) 1.

environmental degradation. In fact, pollution knows no boundaries: the alteration of the water quality of a river in one point will affect the flora and fauna of the environment at another point, as the surrounding communities. International water law by developing a framework of minimum standards that supports efficient and technical measures contributes to build global peace and security.

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